

*California Department of Transportation
Division of Maintenance*

Structure Maintenance and Investigations

B_{RIDGE}

I_{NSPECTION}

R_{ECORDS}

I_{NFORMATION}

S_{YSTEM}

The requested documents have been generated by BIRIS.

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Bridge Number : 10 0136
Facility Carried: STATE ROUTE 1
Location : 01-MEN-001-43.74
City :
Inspection Date : 10/06/2015

Inspection Type				
Routine	FC	Underwater	Special	Other
<input checked="" type="checkbox"/>				

STRUCTURE NAME: ALBION RIVER

Year Built	: 1944	Skew (degrees):	0
Year Widened:	N/A	No. of Joints	: 2
Length (m)	: 295.4	No. of Hinges	: 0

Structure Description: Simply supported 34-span bridge. Timber 2-ply plank deck, with AC riding surface, timber 17-stringer spans on timber A-frame deck trusses on timber tower bents. Eleven timber approach spans at the south end of the bridge, with Span 8 & 10 being a timber A-frame deck truss. A single-span riveted steel deck truss on RC tower bents over the main channel. Twenty-two timber approach spans at the north end of the bridge, with Span 14, 16, 18, 20, 22, 24, 26, 28, & 30 being a timber A-frame deck truss. Both abutments are RC buttress-type 3-column bents on spread footings. Foundations for Bents 2-10 & 26-34 are concrete pedestal-type spread footings, Tower 11-12 is on driven (split-rail reinforced) PC/RC piles and Tower 13-14 is on driven timber piles, Bents 15-25 are concrete pedestal-type footings on driven timber piles. (The main span is a riveted steel deck truss, expansion at Bent 12 and fixed at Bent 13, which was recycled from an old bridge that had been located on the South Fork of the Feather River approximately 1.5 mi. downstream of Bidwell Bar) All timber is treated Douglas Fir (from Washington State).

[illegible]

Design Live Load:	M-13.5 OR H-15		
Inventory Rating:	RF=0.70 =>22.7 metric tons	Calculation Method:	LOAD FACTOR
Operating Rating:	RF=0.95 =>30.8 metric tons	Calculation Method:	LOAD FACTOR
Permit Rating :	PGGGO		
Posting Load :	Type 3: Legal	Type 3S2: Legal	Type 3-3: Legal

Deck X-Section: 0.08 m (0.3 ft) br, 0.30 m (1.0 ft) wg, 7.92 m (26.0 ft), 0.30 m (1.0 ft) wg, 0.08 m (0.3 ft) br

Total Width:	8.6 m	Net Width:	7.9 m	No. of Lanes:	2	Speed:	50 mph
Min. Vertical Clearance:	Unimpaired			Overlay Thickness:	2.0 Inches		

Rail Code: 0010

Rail Type	Location	Length (ft)	Rail Modifications
Timber	Right/Left	600	Timber railings on timber posts, with timber wheel guard in front
Rail			

Channel Description: Wide, sandy bed on flat slope situated in bottom of relatively narrow canyon at outlet to the ocean. Tidally influenced; flow reversal. Bridge is on

DESCRIPTION UNDER STRUCTURE

straight reach downstream of right bend, about 600 feet from the outlet to the ocean.

NOTICE

The bridge inspection condition assessment used for this inspection is based on the American Association of State Highway and Transportation Officials (AASHTO) Bridge Element Inspection Manual 2013 as defined in Moving Ahead for Progress in the 21st Century (MAP-21) federal law. The new element inspection methodology may result in changes to related condition and appraisal ratings on the bridge without significant physical changes at the bridge.

The element condition information contained in this report represents the current condition of the bridge based on the most recent routine and special inspections. Some of the notes presented below may be from an inspection that occurred prior to the date noted in this report. Refer to the Scope and Access section of this inspection report for a description of which portions of the bridge were inspected on this date.

INSPECTION COMMENTARY**SCOPE AND ACCESS**

The creek was flowing at a depth of approximately 6 to 8 feet deep through Span 12 at the time of this investigation. The base of both main-span towers was out of the water. The soffit, superstructure and substructure of Spans 1 through 5 were viewed from the ground underneath. The catwalk of the superstructure was walked from the south end to the north end and back again in order to view the underside of the superstructure of Spans 6 through 32. The underside of the superstructure and the substructure of Spans 33 and 34 were viewed from the ground underneath. A complete routine inspection was performed on all visible elements.

This structure is fracture critical because of the lack of redundancy of the riveted steel deck truss main span. The Fracture Critical Investigation Team is responsible for inspection of the fracture critical steel elements of this bridge. The most recent Fracture Critical Investigation was performed on 03/11/2014 in accordance with the Fracture Critical Member Inspection Plan, dated 03/22/2012. A hands-on visual inspection was performed on the tension members of the left and right steel truss in Span 12. No fractures or cracks were found.

The condition of the structure elements of this bridge below the catwalk could not be properly evaluated during this routine inspection due to the height of the timber towers (over 100 feet tall on average). Only the timbers and fasteners at the base of the bents could be properly examined. (The timber members below the catwalk were inspected in May of 2012 by climbers who repelled from the catwalk.)

A climb team comprised of personnel from the Toll Bridges Investigations Office inspected all timber structure members at and below the catwalk in May 2012. The inspection included close visual and auditory reconnaissance of the full length and all sides of every piece of wood. Any suspect members were drilled to verify their integrity; and, if found to be deficient, the location, amount, and severity of any decay found was documented for future remediation. The 2012 findings are as follows:

The bolted connections are acting as pins, and as long as they are in place, the bridge is in sound condition. If the nuts that retain the galvanized steel bolts or threaded rods should fail, there is a possibility that they will slide out of the connections as the timber members shift. Currently, approximately 50% to 75% of the nuts of the bolted connections in the towers are in unsatisfactory condition due to corrosion from the

INSPECTION COMMENTARY

marine environment. See photos No. 1 thru 10, dated 05/15/12, in BIRIS. Based on the configuration of the timber bents, it has been determined that there are 50 galvanized steel bolts or threaded rods in the top horizontals, 60 galvanized steel bolts or threaded rods at the intermediate horizontals, 8 galvanized steel bolts or threaded rods in the intermediate cross-braces and 114 galvanized steel bolts or threaded rods in the bases; (and depending on the height) the quantities are as follows:

Bents 2-3, 4-5, and 6: 100 galvanized steel bolts or threaded rods.

Bents 7-8: 178 galvanized steel bolts or threaded rods.

Bents 9-10: 436 galvanized steel bolts or threaded rods.

Bents 15-16, 17-18, 19-20, 21-22 and 23-24: 2,560 galvanized steel bolts or threaded rods (512 per tower bent).

Bents 25-26 and 27-28: 888 galvanized steel bolts or threaded rods (444 per tower bent).

Bents 29-30: 379 galvanized steel bolts or threaded rods.

Bents 31-32: 178 galvanized steel bolts or threaded rods.

Bents 33-34: 100 galvanized steel bolts or threaded rods.

Total: 4,819 galvanized steel bolts or threaded rods. Estimate 5,000 galvanized steel bolts or threaded rods, malleys, and nuts for contract purposes.

At least 15 to 20% of the timber scabs at the connections of the legs/columns between each level have 0.25 to 0.5 inch wide splits where the threaded rods, malleys, and nuts have compressed and distorted the wood. See photos 2, 7, & 9, dated 05/15/2012, in BIRIS.

The galvanized steel straps located at every level, which connect/tie the timber legs/columns between each level to the ones above or below across the horizontal timber beams, have moderate to severe areas of corrosion. See photos 1, 3, 5, 6, & 8, dated 05/15/2012, in BIRIS.

Until the work is completed, the Bridge Crew should closely monitor the integrity of the connections and continue as before in replacing fasteners as needed.

MISCELLANEOUS

The main span is a riveted steel deck truss that was recycled from an old bridge that had been located on the South Fork of the Feather River approximately 1.5 miles downstream of Bidwell Bar.

Recommendations to repair or replace portions or all of the structure have been added to the backlog of Outstanding Work for this bridge over more than 20 years. The district established an Expenditure Authorization (EA), 01-40110X, in April 1999 to address many of these issues. A partial listing includes:

- 1.) Replace the wood bridge rail.
- 2.) Remove and replace the bolted connections and hardware throughout the entire timber sub-structure.
- 3.) Replace the steel main span.
- 4.) Or, replace the entire structure.

This project has been included in the district's 2012 SHOPP Plan. It is programmed for funding; the EA is currently active with the contract tentatively scheduled to be advertised in June 2016. No work is under way at this time to deal with most of the outstanding Work Recommendations that have been consolidated under this EA.

A Structure Maintenance & Investigations Peer Review in August 2007 unanimously reaffirmed replacement of the structure as the preferred engineering and most fiscally

INSPECTION COMMENTARY

responsible alternative to ensure the safety and reliability of this critical link of the state highway system. The decision to recommend replacement was based on the significant cost to upgrade the bridge and the need for future preventive maintenance, including continual replacement of the bolted connectors of the timber towers and repainting the truss of the main span of the structure every five to ten years. The district should proceed with complete replacement of this structure.

This structure has been designated "Structurally Deficient" because the 'Substructure' (Item 60 on the Structure Inventory and Appraisal Report sheet) is rated a "4". Major rehabilitation (or replacement) is required to improve the Condition State of the element, which will raise the Condition Rating, which will remove the "Structurally Deficient" status and improve the Sufficiency Rating.

SAFE LOAD CAPACITY

A Structure Rating Data Sheet, dated 11/01/2011, is on file for this structure. While this report does not include a check of that analysis, it does verify that the structural conditions observed during this inspection are consistent with those assumed in that analysis. The current ratings are based on Midas computer program output, dated 10/20/2011.

The steel deck truss main span and the timber trestle approach spans were analyzed separately; the main span was found to have lower Inventory, Operating, and Permit Ratings than the approach spans, and therefore, to be the controlling portion of the structure. The load rating values shown are for the main span.

STEEL INVESTIGATIONS

This structure qualifies for an in-depth Steel investigation because it possesses the following fracture critical or fatigue prone details :

Truss: FC Members with Category E Welds

Fracture Critical: Yes

Inspection Freq.: 24

Next Inspection: 03/11/2016

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each	Condition	State
						St. 1	St. 2	St. 3 St. 4
Element Group: 101 - Approach - Southern Spans 1-11 - Timber Deck Trusses								
31		Deck-Timber	3	651	sq.m	638	0	13 0
1140		Decay/Section Loss (Timber)	3	13		0	0	13 0
510		Deck Wearing Surface-Asphalt	3	594	sq.m	475	0	119 0
3210		Delam./Pothole-AC (WS)	3	119		0	0	119 0

(31-1140)

The timber members under the scuppers at the base of the wheel guards on both sides of the deck are decaying.

(31-510-3210)

The AC on the deck in Span 1 and 2 has multiple 2 to 3 feet diameter patches where potholes had occurred in both lanes.

The AC of the southbound lane in Span 3 and 4 has map pattern cracks and raveling.

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each Condition State			
							St. 1	St. 2	St. 3	St. 4

Element Group: 101 - Approach - Southern Spans 1-11 - Timber Deck Trusses

The AC of the southbound lane in Span 1 has map pattern cracks and raveling.

There are numerous repaired, patched, and cracked and raveled areas in both lanes throughout the spans.

There are numerous 0.02 to 0.08 inch wide random cracks in the AC riding surface.

117	Stringer-Timber	3	1280	m	1280	0	0	0
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(117)

There were no significant defects noted.

135	Truss-Timber	3	46	m	0	0	46	0
1020	Connection	3	46		0	0	46	0

(135-1020)

The threaded fasteners are in very poor condition and continue to deteriorate. The marine environment has caused near total corrosion of a large number of the nuts on the threaded rods that hold the timber members in place.

156	Floor Beam-Timber	3	52	m	0	0	52	0
1020	Connection	3	52		0	0	52	0

(156-1020)

The threaded fasteners are in very poor condition and continue to deteriorate. The marine environment has caused near total corrosion of a large number of the nuts on the threaded rods that hold the timber members in place.

205	Column-RC	3	2	each	2	0	0	0
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(205)

There were no significant defects noted.

206	Column-Timber	3	134	each	0	0	134	0
1020	Connection	3	134		0	0	134	0

(206)

The threaded fasteners are in very poor condition and continue to deteriorate. The marine environment has caused near total corrosion of a large number of the nuts on the threaded rods that hold the timber members in place.

(206-1020)

The threaded fasteners are in very poor condition and continue to deteriorate. The marine environment has caused near total corrosion of a large number of the nuts on the threaded rods that hold the timber members in place.

208	Trestle-Timber	3	116	m	0	0	116	0
1020	Connection	3	116		0	0	116	0

(208-1020)

The threaded fasteners are in very poor condition and continue to deteriorate. The marine environment has caused near total corrosion of a large number of the nuts on the threaded rods that hold the timber members in place.

215	Abutment-RC	3	11	m	11	0	0	0
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(215)

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each State	St. 1	St. 2	St. 3	St. 4
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Element Group: 101 - Approach - Southern Spans 1-11 - Timber Deck Trusses

There were no significant defects noted.

234		Pier Cap-RC	3	8	m	8	0	0	0
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(234)

There were no significant defects noted.

235		Pier Cap-Timber	3	52	m	0	0	52	0
1020		Connection	3	52		0	0	52	0

(235-1020)

The threaded fasteners are in very poor condition and continue to deteriorate. The marine environment has caused near total corrosion of a large number of the nuts on the threaded rods that hold the timber members in place.

332		Railing-Timber	3	512	m	512	0	0	0
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(332)

The timber bridge rail was cleaned and painted in 2013 (as part of EA 01-0A5904). There were no significant defects noted.

Element Group: 102 - Main - Main Span - Steel Deck Truss

31		Deck-Timber	3	341	sq.m	334	0	7	0
1140		Decay/Section Loss (Timber)	3	7		0	0	7	0
510		Deck Wearing Surface-Asphalt	3	341	sq.m	273	0	68	0
3210		Delam./Pothole-AC (WS)	3	68		0	0	68	0

(31-1140)

The timber members under the scuppers at the base of the wheel guards on both sides of the deck are decaying.

(31-510-3210)

The AC of the north end southbound lane in Span 12, adjacent to the open expansion joint at Bent 13, has patched potholes, map pattern cracks, and raveling.

There are numerous repaired, patched, and cracked and raveled areas in both lanes throughout the span.

120		Truss-Steel	4	79	m	71	0	8	0
1000		Corrosion	4	8		0	0	8	0
515		Steel Coating-Paint	4	876	sq.m	876	0	0	0

(120-1000)

There is minor section loss less than 0.20 inch in random locations on all truss members, particularly on flange edges. All truss members exhibit some pitting of less than 0.20 inch.

(120-515)

The steel deck truss of the main span was cleaned and painted in the fall of 2013 as part of EA 01-0A5904. The paint system on the main span steel deck truss appears to be in excellent condition.

156		Floor Beam-Timber	4	573	m	573	0	0	0
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(156)

There were no significant defects noted.

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each State	St. 1	St. 2	St. 3	St. 4
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Element Group: 102 - Main - Main Span - Steel Deck Truss

205			Column-RC		3	4	each	4	0	0	0
(205)											
There were no significant defects noted.											
There is a 6 inch diameter spall with an exposed and corroded steel reinforcing bar on the east side of the south wall of the base of Tower 13-14.											
Local scour exists at Piers 12 and 13 due to tidal influence on the river flows.											
227			Pile-RC		2	1	ea.	1	0	0	0
(227)											
The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.											
228			Pile-Timber		2	1	ea.	1	0	0	0
(228)											
The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.											
234			Pier Cap-RC		3	17	m	17	0	0	0
(234)											
There were no significant defects noted.											
304			Joint-Open Expansion		3	17	m	17	0	0	0
(304)											
There were no significant defects noted.											
311			Bearing-Moveable		4	2	each	2	0	0	0
(311)											
There were no significant defects noted.											
313			Bearing-Fixed		4	2	each	2	0	0	0
(313)											
There were no significant defects noted.											
332			Railing-Timber		3	79	m	79	0	0	0
(332)											
The timber bridge rail was cleaned and painted in 2013 as part of EA 01-0A5904. There were no significant defects noted.											
Element Group: 103 - Approach - Northern Spans 13-34 - Timber Deck Trusses											
31			Deck-Timber		2	1557	sq.m	1526	0	31	0
1140			Decay/Section Loss (Timber)		2	31		0	0	31	0
510			Deck Wearing Surface-Asphalt		2	1420	sq.m	1136	0	284	0
3210			Delam./Pothole-AC (WS)		2	284		0	0	284	0
(31-1140)											
The scuppers at the base of the wheel guards on both sides of the deck at the north end of the bridge are plugged with dirt and weeds.											

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Defect	Element Description	Env Qty	Total	Units	Qty in each Condition	State
							St. 1	St. 2
							St. 3	St. 4

Element Group: 103 - Approach - Northern Spans 13-34 - Timber Deck Trusses

The timber members under the scuppers at the base of the wheel guards on both sides of the deck are decaying.

(31-510-3210)

The AC of the northbound lane in Span 16 has map pattern cracks and raveling in the right wheel line. It has been repaired, but the pavement immediately adjacent to it continues to crack and ravel.

There are numerous repaired, patched, and cracked and raveled areas in both lanes throughout the spans.

117	Stringer-Timber	3	3052	m	3052	0	0	0
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(117)

There were no significant defects noted.

135	Truss-Timber	3	208	m	0	3	205	0
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1020	Connection	3	205		0	0	205	0
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1140	Decay/Section Loss (Timber)	3	3		0	3	0	0
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(135-1020)

The threaded fasteners are in very poor condition and continue to deteriorate. The marine environment has caused near total corrosion of a large number of the nuts on the threaded rods that hold the timber members in place.

The threaded connector that bolts a 3 inch by 8 inch diagonal brace at Bent 17, which is attached to the left side of Column 3 at the catwalk level and extends to the top of Column 3 in Bent 18, has sheared off between the brace and the post.

(135-1140)

An area of decay was found at the top left horizontal between Bent 15 and Bent 16. The top 4 inches has core rot and extends 10 feet from Bent 15 towards Bent 16.

156	Floor Beam-Timber	3	243	m	0	0	243	0
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1020	Connection	3	243		0	0	243	0
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(156-1020)

The threaded fasteners are in very poor condition and continue to deteriorate. The marine environment has caused near total corrosion of a large number of the nuts on the threaded rods that hold the timber members in place.

205	Column-RC	3	2	each	1	0	1	0
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1080	Delamination/Spall/Patched Area	3	1		0	0	1	0
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(205)

There were no significant defects noted.

(205-1080)

Column 2 in Bent 14, the north half of the north concrete tower, has an incipient spall along its northeast corner. The spall is located about 20 feet above the ground, and measures about 24 inches tall by 12 inches wide.

206	Column-Timber	3	80	each	0	0	80	0
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1020	Connection	3	80		0	0	80	0
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(206-1020)

The threaded fasteners are in very poor condition and continue to deteriorate. The marine

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Defect	Element Description	Env Qty	Total	Units	Qty in each Condition	State
							St. 1	St. 2
							St. 3	St. 4

Element Group: 103 - Approach - Northern Spans 13-34 - Timber Deck Trusses

environment has caused near total corrosion of a large number of the nuts on the threaded rods that hold the timber members in place.

208	Trestle-Timber	3	600	m	0	0	190	410
1020	Connection	3	410		0	0	0	410
1140	Decay/Section Loss (Timber)	3	190		0	0	190	0

(208-1020)

The threaded fasteners are in very poor condition and continue to deteriorate. The marine environment has caused near total corrosion of a large number of the nuts on the threaded rods that hold the timber members in place.

(208-1140)

The horizontal transverse beam at the base of the legs of Bent 27 has 0.16 to 0.32 inch wide cracks in its sides between Post/Leg 3 and Post/Leg 4. The wood around the cracks/splits is damp and the interior appears to be soft when poked with a knife or awl. The member was drilled with an auger bit and found to be decayed in the core. The condition was only present in the area between the vertical members. When the beam was drilled under the posts no decay was found.

The horizontal transverse beam at the base of the legs of Bent 29 has 0.16 to 0.32 inch wide cracks in its top between Post/Leg 1 and Post/Leg 2, and between Post/Leg 2 and Post/Leg 3. The wood around the cracks/splits is damp and the interior appears to be soft then poked with a knife or awl. See photos No. 19 & 20, dated 10/06/2011, in BIRIS.

215	Abutment-RC	3	11	m	11	0	0	0
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(215)

There were no significant defects noted.

234	Pier Cap-RC	3	8	m	8	0	0	0
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(234)

There were no significant defects noted.

235	Pier Cap-Timber	3	17	m	17	0	0	0
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(235)

There were no significant defects noted.

332	Railing-Timber	3	358	m	358	0	0	0
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(332)

The timber bridge rail was cleaned and painted in 2013 (as part of EA 01-0A5904). There were no significant defects noted.

WORK RECOMMENDATIONS

RecDate: 01/16/2014

Action : Sub-Patch spalls

Work By: BRIDGE CREW

Status : PROPOSED

EstCost: \$5,200

StrTarget: 1 YEAR

DistTarget:

EA:

Repair Column 2 in Bent 14, the north half of the north concrete tower, where there is an incipient spall along its northeast corner. The spall is located about 20 feet above the ground, and measures about 24 inches tall by 12 inches wide.

WORK RECOMMENDATIONS

RecDate: 10/06/2011
 Action : Deck-Rehab
 Work By: MAINT. CONTRACT
 Status : INITIATED

EstCost: \$228,600
 StrTarget: 1 YEAR
 DistTarget:
 EA: 0E200

There are numerous repaired, patched, and cracked and raveled areas in both lanes in nearly all spans. The cracking, raveling, and potholing of the AC indicates that the timber two-layer plank deck under the AC is rotting and crushing, causing the failure of the AC riding surface. The timber plank deck appears to have reached the end of its service life. Remove the AC; remove and replace any deteriorated timber planks; place a new waterproof membrane on the timber planks; place a new course of AC on the membrane.

RecDate: 10/06/2011
 Action : Sub-Misc.
 Work By: MAINT. CONTRACT
 Status : INITIATED

EstCost: \$150,000
 StrTarget: 1 YEAR
 DistTarget:
 EA: 0E200

Repair (remove and replace and/or supplement) all portions of the horizontal transverse beam at the base of the legs of Bent 27 & 29 where the wood is decayed in the interior. Portions of the members were drilled with an auger bit and found to be decayed in the core.

RecDate: 03/28/2007
 Action : Seismic-Retrofit
 Work By: STRAIN
 Status : PROGRAMMED

EstCost: \$1,270,000
 StrTarget: 2 YEARS
 DistTarget:
 EA: 40110

Steel truss members may require strengthening. Priority 4. Final Score 2.8125.

BELOW THE LINE

RecDate: 11/06/2002
 Action : Sub-Misc.
 Work By: MAINT. CONTRACT
 Status : INITIATED

EstCost: \$750,000
 StrTarget: 2 YEARS
 DistTarget:
 EA: 0E200

Continue the ongoing program of replacement of timber fasteners. Remove and replace the bolted connections and hardware (threaded rods, malleys, nuts, splice plates/straps, scabs, etc.) throughout the entire timber sub-structure.

RecDate: 04/05/1999
 Action : Bridge-Replace
 Work By: STRAIN
 Status : PROGRAMMED

EstCost: \$13,200,000
 StrTarget: 2 YEARS
 DistTarget:
 EA: 40110

Replace the steel main span. Estimated at \$2,000,000 (NOT including traffic handling costs). Or, replace the entire structure. Estimated at \$13,200,000.

THIS AGING STRUCTURE IS IN A MARGINAL AND DETERIORATING CONDITION. IT IS FUNCTIONALLY OBSOLETE, HAS A LOW LOAD RATING, AND IS AN INAPPROPRIATE DESIGN FOR THE ENVIRONMENT. THE LIFE CYCLE ECONOMIC COST OF ADEQUATE MAINTENANCE DOES NOT COMPARE FAVORABLY WITH COST OF REPLACEMENT WITH A STRUCTURE TYPE BETTER SUITED TO THE ENVIRONMENT.

IT IS THEREFORE URGENTLY RECOMMENDED THAT THIS STRUCTURE BE REPLACED. AN SM&I PEER REVIEW IN AUGUST 2007 REAFFIRMED THE RECOMMENDATION THAT THIS BRIDGE BE

WORK RECOMMENDATIONS

REPLACED.

RecDate: 07/01/1986

Action : Sub-Rehab

Work By: STRAIN

Status : PROGRAMMED

EstCost: \$1,500,000

StrTarget: 2 YEARS

DistTarget:

EA: 40110

Remove and replace the bolted connections and hardware (threaded rods, malleys, nuts, splice plates/straps, etc) throughout the entire timber sub-structure. Replace the top left horizontal timber element between Bent 15 and Bent 16.

RecDate: 02/10/1984

Action : Railing-Upgrade

Work By: STRAIN

Status : PROGRAMMED

EstCost: \$1,008,600

StrTarget: 2 YEARS

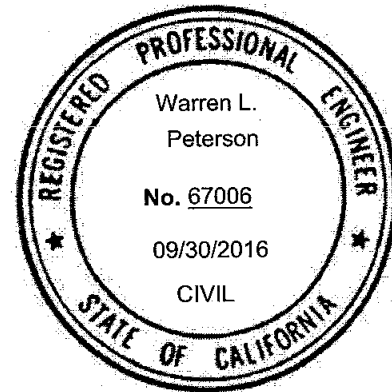
DistTarget:

EA: 40110

F1-10 / F2-6 / F3-1 / Rail Type-WOOD.
Replace the bridge rail.

Team Leader : Warren L. Peterson
 Report Author : Warren L. Peterson
 Inspected By : WL.Peterson/JE.Edwards

WL Peterson 3/24/14
 Warren L. Peterson (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 10 0136
 (5) INVENTORY ROUTE (ON/UNDER)- ON 131000010
 (2) HIGHWAY AGENCY DISTRICT 01
 (3) COUNTY CODE 045 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- ALBION RIVER
 (7) FACILITY CARRIED- STATE ROUTE 1
 (9) LOCATION- 01-MEN-001-43.74
 (11) MILEPOINT/KILOMETERPOINT 43.74
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000101
 (16) LATITUDE 39 DEG 13 MIN 30.32 SEC
 (17) LONGITUDE 123 DEG 46 MIN 09.83 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

***** STRUCTURE TYPE AND MATERIAL *****

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL
 TYPE- TRUSS - DECK CODE 309
 (44) STRUCTURE TYPE APPR:MATERIAL- WOOD OR TIMBER
 TYPE- STRINGER/MULTI-BEAM OR GDR CODE 702
 (45) NUMBER OF SPANS IN MAIN UNIT 1
 (46) NUMBER OF APPROACH SPANS 33
 (107) DECK STRUCTURE TYPE- TIMBER CODE 8
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- BITUMINOUS CODE 6
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

***** AGE AND SERVICE *****

(27) YEAR BUILT 1944
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY 1
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 2100
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 6 %
 (19) BYPASS, DETOUR LENGTH 51 KM

***** GEOMETRIC DATA *****

(48) LENGTH OF MAXIMUM SPAN 39.6 M
 (49) STRUCTURE LENGTH 295.4 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.9 M
 (52) DECK WIDTH OUT TO OUT 8.6 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 7.3 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 0 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 7.9 M
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 M
 (54) MIN VERT UNDERCLEAR REF- NOT H/RR 0.00 M
 (55) MIN LAT UNDERCLEAR RT REF- NOT H/RR 0.0 M
 (56) MIN LAT UNDERCLEAR LT 0.0 M

***** NAVIGATION DATA *****

(38) NAVIGATION CONTROL- BR PERMIT REQ CODE 1
 (111) PIER PROTECTION- NOT REQUIRED CODE 1
 (39) NAVIGATION VERTICAL CLEARANCE 50.0 M
 (116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR M
 (40) NAVIGATION HORIZONTAL CLEARANCE 35.7 M

***** SUFFICIENCY RATING *****

SUFFICIENCY RATING = 15.3
 STATUS STRUCTURALLY DEFICIENT
 HEALTH INDEX 81.7
 PAINT CONDITION INDEX = 100.0

***** CLASSIFICATION ***** CODE

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL RURAL 06
 (100) DEFENSE HIGHWAY- NOT STRAHNET 0
 (101) PARALLEL STRUCTURE- NONE EXISTS N
 (102) DIRECTION OF TRAFFIC- 2 WAY 2
 (103) TEMPORARY STRUCTURE-
 (105) FED.LANDS HWY- NOT APPLICABLE 0
 (110) DESIGNATED NATIONAL NETWORK - NOT ON NET 0
 (20) TOLL- ON FREE ROAD 3
 (21) MAINTAIN- STATE HIGHWAY AGENCY 01
 (22) OWNER- STATE HIGHWAY AGENCY 01
 (37) HISTORICAL SIGNIFICANCE- ELIGIBLE 2

***** CONDITION ***** CODE

(58) DECK 7
 (59) SUPERSTRUCTURE 7
 (60) SUBSTRUCTURE 3
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- M-13.5 OR H-15 2
 (63) OPERATING RATING METHOD- LOAD FACTOR 1
 (64) OPERATING RATING- 30.8
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1
 (66) INVENTORY RATING- 22.7
 (70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
 (41) STRUCTURE OPEN, POSTED OR CLOSED- A
 DESCRIPTION- OPEN, NO RESTRICTION

***** APPRAISAL ***** CODE

(67) STRUCTURAL EVALUATION 3
 (68) DECK GEOMETRY 3
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 0010
 (113) SCOUR CRITICAL BRIDGES 5

***** PROPOSED IMPROVEMENTS *****

(75) TYPE OF WORK- DECK REPLACEMENT CODE 37
 (76) LENGTH OF STRUCTURE IMPROVEMENT 295.4 M
 (94) BRIDGE IMPROVEMENT COST \$2,540,000
 (95) ROADWAY IMPROVEMENT COST \$508,000
 (96) TOTAL PROJECT COST \$4,267,200
 (97) YEAR OF IMPROVEMENT COST ESTIMATE 2010
 (114) FUTURE ADT 5182
 (115) YEAR OF FUTURE ADT 2037

***** INSPECTIONS *****

(90) INSPECTION DATE 10/15 (91) FREQUENCY 24 MO
 (92) CRITICAL FEATURE INSPECTION: (93) CFI DATE
 A) FRACTURE CRIT DETAIL- YES 24 MO A) 03/14
 B) UNDERWATER INSP- NO MO B)
 C) OTHER SPECIAL INSP- NO MO C)

STRUCTURE RATING DATA SHEET

BRIDGE NO: 10 0136
 Facility Carrier: STATE ROUTE 1
 Location: 01-MEN-001-43.74
 BRIDGE NAME: ALBION RIVER

Structural Elements Rated :

Element rated in steel deck truss main span:
 timber deck planks, timber floor beams, steel deck truss members.

DESIGN LOADING

	Rating	Metric	CRITICAL LOCATION				Rating
	Factor	Tonnes	Structure	Control Element	Load Action	Location	Method
Inventory	0.70	22.7	Span 12	Floorbeam	Shear	3.75' away from center of bridge	LFR
Operating	0.95	30.8	Span 12	Floorbeam	Shear	3.75' away from center of bridge	LFR

LEGAL RATING

		Posting US Tons					
Type 3 (25T)	1.50		Span 12	Truss	Compression	Sub vert post near mid span	LFR
Type 3S2 (36T)	1.65		Span 12	Truss	Compression	Sub vert post near mid span	LFR
Type 3-3 (40T)	1.82		Span 12	Truss	Compression	Sub vert post near mid span	LFR

PERMIT RATING

		Permit Rating					
5 Axle Truck	1.00	P	Span 12	Truss	Compression	Sub vert post near mid span	LFR
7 Axle Truck	0.99	G	Span 12	Truss	Compression	Sub vert post near mid span	LFR
9 Axle Truck	0.95	G	Span 12	Truss	Compression	Vert post @ U2L2	LFR
11 Axle Truck	0.88	G	Span 12	Truss	Compression	Vert post @ U2L2	LFR
13 Axle Truck	0.84	O	Span 12	Truss	Compression	Vert post @ U2L2	LFR
15 Axle Truck							

RELEVANT LOAD RATING INFORMATION

Reason for New Rating Analysis: ABME has requested to perform the rating analysis using LFD method in order to comply with FHWA mandate

Notes:

- The timber components are assumed to be rough sawn Douglas Fir-Larch and have the following material properties:
 Deck Planks: E=1800000psi, Fb=875psi, Fv=95psi
 Floor Beams: E=1800000psi, Fb=1500psi, Fv=85psi
- Shear stress factor 1.33 and 1.67 are used for timber deck planks and timber floor beams, respectively.
- Steel strength fy=33ksi is used for all steel deck truss members.
- 1.15 wide spaced/overweight factor is applied for permit trucks.
- Rating factors in SMART have not been updated. ABME will inspect this bridge more closely to verify the member conditions. The timber approach spans will be rated in the future.

Overlay Used in Rating: 2" AC filled
 Assigned / Calculated: Calculated
 Rating Date: November 1, 2011
 Rated By: Li Zhang
 Checked By: Jack Hu/Richard Tsang
 Analysis Tool: Midas & Hand Calc
 Rating Method: Load Factor Method for Inventory Rating
 Load Factor Method for Operating Rating

Rating File Location: Rating Bridge File

- ☐ Calculations have been included with this summary sheet for filing in Bridge Records
☒ Calculations have NOT been included, but are available in SMI, Rating Section



Bridge Number : 10 0136
Facility Carried: STATE ROUTE 1
Location : 01-MEN-001-43.74
City :
Inspection Date : 03/11/2014
Inspection Type
Routine FC Underwater Special Other

X

ClibPDF - www.fastio.com

DESCRIPTION UNDER STRUCTURE

reach downstream of right bend, about 180 m from the outlet to the ocean.

INSPECTION COMMENTARY**SCOPE AND ACCESS**

A fracture critical inspection was performed on 03/11/2014 by Jason Crispi from the Office of Specialty Investigations and Bridge Management. ABME Tim Sandoval from the Office of Structure Maintenance and Investigations accompanied the inspection.

The structure was accessed with the UBIT operated by Jerry Young. Lane closures and traffic control were provided by the District 1 bridge maintenance crew.

The investigation was conducted in accordance with the Fracture Critical Member Inspection Plan, dated 03/22/2012.

SUPERSTRUCTURE

A hands-on visual inspection was performed on the tension members of the left and right steel truss in Span 12. No fractures or cracks were found.

All comments in the previous report regarding corrosion and pack rust are no longer present after the bridge has been cleaned and repainted recently. However, there is minor section loss less than 5 mm in random locations on all truss members, particularly on flange edges (See Photo #6). All truss members exhibit some pitting less than 2 mm.

STEEL INVESTIGATIONS

This structure qualifies for an in-depth Steel investigation because it possesses the following fracture critical or fatigue prone details :

Truss: FC Members with Category E Welds

Fracture Critical: Yes Inspection Freq.: 24 Next Inspection: 03/11/2016

Team Leader : Jason Crispi
 Report Author : Jason Crispi
 Inspected By : J.Crispi/C.Kussoy



Chaz Kussoy (Registered Civil Engineer)

6/24/2014 (Date)


DEPARTMENT OF TRANSPORTATION
 Structure Maintenance & Investigations

 Bridge Number : 10 0136
 Facility Carried: STATE ROUTE 1
 Location : 01-MEN-001-43.74
 City :
 Inspection Date : 01/16/2014

Bridge Inspection Report
Inspection Type

Routine FC Underwater Special Other

☒
STRUCTURE NAME: ALBION RIVER

CONSTRUCTION INFORMATION

 Year Built : 1944
 Year Widened: N/A
 Length (m) : 295.4
 Skew (degrees): 0
 No. of Joints : 2
 No. of Hinges : 0

Structure Description: Simply supported 34-span bridge. Timber 2-ply plank deck, with AC riding surface, timber 17-stringer spans on timber A-frame deck trusses on timber tower bents. Eleven timber approach spans at the south end of the bridge, with Span 8 & 10 being a timber A-frame deck truss. A single-span riveted steel deck truss on RC tower bents over the main channel. Twenty-two timber approach spans at the north end of the bridge, with Span 14, 16, 18, 20, 22, 24, 26, 28, & 30 being a timber A-frame deck truss. Both abutments are RC buttress-type 3-column bents on spread footings. Foundations for Bents 2-10 & 26-34 are concrete pedestal-type spread footings, Tower 11-12 is on driven (split-rail reinforced) PC/RC piles and Tower 13-14 is on driven timber piles, Bents 15-25 are concrete pedestal-type footings on driven timber piles. (The main span is a riveted steel deck truss, expansion at Bent 12 and fixed at Bent 13, which was recycled from an old bridge that had been located on the South Fork of the Feather River approximately 1.5 mi. downstream of Bidwell Bar) All timber is treated Douglas Fir (from Washington State).

Span Configuration : 7 @ 5.79 m (19.0 ft), 11.58 m (38.0 ft), 5.79 m (19.0 ft), 11.58 m (38.0 ft), 5.03 m (16.5 ft), 39.62 m (130.0 ft), 5.03 m (16.5 ft), 11.58 m (38.0 ft), 5.79 m (19.0 ft), 11.58 m (38.0 ft), 5.79 m (19.0 ft), 11.58 m (38.0 ft), 5.79 m (19.0 ft), 11.58 m (38.0 ft), 5.79 m (19.0 ft), 11.58 m (38.0 ft), 5.79 m (19.0 ft), 11.58 m (38.0 ft), 5.79 m (19.0 ft), 11.58 m (38.0 ft), 5.79 m (19.0 ft), 11.58 m (38.0 ft), 5.79 m (19.0 ft), 11.58 m (38.0 ft), 5.79 m (19.0 ft), 11.58 m (38.0 ft), 5.79 m (19.0 ft), 11.58 m (38.0 ft), 4 @ 5.79 m (19.0 ft)

SAFE LOAD CAPACITY AND RATINGS

 Design Live Load: M-13.5 OR H-15
 Inventory Rating: RF=0.70 =>22.7 metric tons
 Operating Rating: RF=0.95 =>30.8 metric tons
 Permit Rating : PGGGO
 Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal
 Calculation Method: LOAD FACTOR
 Calculation Method: LOAD FACTOR

DESCRIPTION ON STRUCTURE

Deck X-Section: 0.08 m (0.3 ft) br, 0.30 m (1.0 ft) wg, 7.92 m (26.0 ft), 0.30 m (1.0 ft) wg, 0.08 m (0.3 ft) br

 Total Width: 8.6 m Net Width: 7.9 m No. of Lanes: 2 Speed: 50 mph
 Min. Vertical Clearance: Unimpaired

Rail Code: 0010

Rail Type	Location	Length (ft)	Rail Modifications
Timber Rail	Right/Left	600	Timber railings on timber posts, with timber wheel guard in front

DESCRIPTION UNDER STRUCTURE

Channel Description: Wide, sandy bed on flat slope situated in bottom of relatively narrow canyon at outlet to the ocean. Tidally influenced; flow reversal. Bridge is on

DESCRIPTION UNDER STRUCTURE

straight reach downstream of right bend, about 180 m from the outlet to the ocean.

INSPECTION COMMENTARY

SCOPE AND ACCESS

The approaches, deck, superstructure, and substructure were visually inspected on foot from the ground and the catwalk. The underside of the superstructure and the substructure of Spans 1 through 5 were viewed from the ground underneath; the catwalk of the superstructure was walked from the south end to the north end and back again in order to view the underside of the superstructure of Spans 6 through 32. The underside of the superstructure and the substructure of Spans 33 and 34 were viewed from the ground underneath. Towers 7-8 and 9-10 were inaccessible because of the tall, steep slope of the terrain and the dense vegetation - including poison oak. The base of both main-span towers was out of the water. The water level in the river under Span 12 was approximately 6 to 8 feet. Minor local scour was observed on the river side of both towers. The base of Towers 15-16, 17-18, 19-20, 21-22, 23-24, 25-26, and 27-28 were inspected from the ground around them. Towers 29-30 and 31-32 were inaccessible because of the tall, steep slope of the terrain and the dense vegetation - including poison oak.

This structure is fracture critical because of the lack of redundancy of the riveted steel deck truss main span. The Fracture Critical Investigation Team is responsible for inspection of the fracture critical steel elements of this bridge. The most recent Fracture Critical Investigation performed on this structure was on 03/22/2012 using the Under Bridge Inspection Truck.

REVISIONS

ELI Element 32 - Timber Deck with AC Overlay - in the ELEMENT INSPECTION RATINGS Table - has been moved from Condition State 2 to 3 because of the numerous locations where the AC riding surface has cracked, raveled, and potholed.

ELI Element 131 - Painted Steel Deck Truss - in the ELEMENT INSPECTION RATINGS Table - has been moved from Condition State 4 to 1 as a result of being fully cleaned and painted.

NBI Item 64 - Operating Rating - has been changed from 51.2 metric tons to 30.8 metric tons as a result of re-evaluating the load capacity of the bridge based on current standard practices and procedures by the Load Rating Branch.

NBI Item 66 - Inventory Rating - has been changed from 30.8 metric tons to 22.7 metric tons as a result of re-evaluating the load capacity of the bridge based on current standard practices and procedures by the Load Rating Branch.

The Permit Rating has been changed from POOXX to PGGGO (for P5 thru P13 axle truck configurations).

DECK AND ROADWAY

The AC on the deck in Span 1 and 2 has multiple 2 to 3 feet diameter patches where potholes had occurred in both lanes. See photo No. 5, dated 10/06/2011, available in BIRIS.

INSPECTION COMMENTARY

The AC of the southbound lane in Span 3 and 4 has map pattern cracks and raveling. See photo No. 6, dated 10/06/2011, in BIRIS.

The AC of the southbound lane in Span 1 has map pattern cracks and raveling. See photo No. 7, dated 10/06/2011, in BIRIS.

There are numerous 0.02 to 0.08 inch wide random cracks in the AC riding surface.

The AC of the north end southbound lane in Span 12, adjacent to the open expansion joint at Bent 13, has patched potholes, map pattern cracks, and raveling. See photo No. 8, dated 10/06/2011, in BIRIS.

The AC of the northbound lane in Span 16 has map pattern cracks and raveling in the right wheel line. It has been repaired, but the pavement immediately adjacent to it continues to crack and ravel. See photo No. 10, dated 10/06/2011, in BIRIS.

There are numerous repaired, patched, and cracked and raveled areas in both lanes in nearly all spans. The cracking, raveling, and potholing of the AC indicates that the timber two-layer plank deck under the AC is rotting and crushing, causing the failure of the AC riding surface. The timber plank deck appears to have reached the end of its service life. See photos No. 13 & 14, dated 10/06/2011, in BIRIS.

The scuppers at the base of the wheel guards on both sides of the deck at the north end of the bridge are plugged with dirt and weeds.

The timber bridge rail was cleaned and painted in 2013 (as part of EA 01-0A5904).

SUPERSTRUCTURE

The threaded fasteners are in very poor condition and continue to deteriorate. Access was limited to the timbers and fasteners immediately adjacent to the catwalk. Even so, it was obvious that the marine environment has caused near total corrosion of a large number of the nuts on the threaded rods that hold the timbers in place.

The steel deck truss of the main span was cleaned and painted in the fall of 2013 (as part of EA 01-0A5904). The paint system on the main span steel deck truss appears to be in excellent condition. See photos No. 3 & 4, dated 01/16/2014, submitted with this report and in BIRIS.

An area of decay was found at the top left horizontal between Bent 15 and Bent 16. The top 4 inches has core rot and extends 10 feet from Bent 15 towards Bent 16.

The 2012 Fracture Critical Inspection, which occurred prior to the cleaning and painting, consisted of an overall visual inspection with the following conditions noted:

Moderate-to-heavy expansive corrosion was found along the top chord of the steel trusses. No defect indications were found.

This structure is on a 24-month inspection cycle for Fracture Critical members/elements. The next Fracture Critical Inspection is due in March 2014.

The threaded connector that bolts a 3 inch by 8 inch diagonal brace at Bent 17, which is attached to the left side of Column 3 at the catwalk level and extends to the top of Column 3 in Bent 18, has sheared off between the brace and the post. See photo No. 5, dated 01/16/2014, submitted with this report and in BIRIS.

SUBSTRUCTURE

INSPECTION COMMENTARY

The condition of the structure elements of this bridge below the catwalk could not be properly evaluated during this routine inspection due to the height of the timber towers (over 100 feet tall on average). Only the timbers and fasteners at the base of the bents could be properly examined. (The timber members below the catwalk were inspected in May of 2012 by climbers who repelled from the catwalk.)

A climb team comprised of personnel from the Toll Bridges Investigations Office inspected all timber structure members at and below the catwalk in May 2012. The inspection included close visual and auditory reconnaissance of the full length and all sides of every piece of wood. Any suspect members were drilled to verify their integrity; and, if found to be deficient, the location, amount, and severity of any decay found was documented for future remediation. The 2012 findings are as follows:

The bolted connections are acting as pins, and as long as they are in place, the bridge is in sound condition. If the nuts that retain the galvanized steel bolts or threaded rods should fail, there is a possibility that they will slide out of the connections as the timber members shift. Currently, approximately 50% to 75% of the nuts of the bolted connections in the towers are in unsatisfactory condition due to corrosion from the marine environment. See photos No. 1 thru 10, dated 05/15/12, in BIRIS. Based on the configuration of the timber bents, it has been determined that there are 50 galvanized steel bolts or threaded rods in the top horizontals, 60 galvanized steel bolts or threaded rods at the intermediate horizontals, 8 galvanized steel bolts or threaded rods in the intermediate cross-braces and 114 galvanized steel bolts or threaded rods in the bases; (and depending on the height) the quantities are as follows:

Bents 2-3, 4-5, and 6: 100 galvanized steel bolts or threaded rods.

Bents 7-8: 178 galvanized steel bolts or threaded rods.

Bents 9-10: 436 galvanized steel bolts or threaded rods.

Bents 15-16, 17-18, 19-20, 21-22 and 23-24: 2,560 galvanized steel bolts or threaded rods (512 per tower bent).

Bents 25-26 and 27-28: 888 galvanized steel bolts or threaded rods (444 per tower bent).

Bents 29-30: 379 galvanized steel bolts or threaded rods.

Bents 31-32: 178 galvanized steel bolts or threaded rods.

Bents 33-34: 100 galvanized steel bolts or threaded rods.

Total: 4,819 galvanized steel bolts or threaded rods. Estimate 5,000 galvanized steel bolts or threaded rods, malleys, and nuts for contract purposes.

At least 15 to 20% of the timber scabs at the connections of the legs/columns between each level have 0.25 to 0.5 inch wide splits where the threaded rods, malleys, and nuts have compressed and distorted the wood. See photos 2, 7, & 9, dated 05/15/2012, in BIRIS.

The galvanized steel straps located at every level, which connect/tie the timber legs/columns between each level to the ones above or below across the horizontal timber beams, have moderate to severe areas of corrosion. See photos 1, 3, 5, 6, & 8, dated 05/15/2012, in BIRIS.

Until the work is completed, the Bridge Crew should closely monitor the integrity of the connections and continue as before in replacing fasteners as needed.

There is a 6 inch diameter spall with an exposed and corroded steel reinforcing bar on the east side of the south wall of the base of Tower 13-14.

Local scour exists at Piers 12 and 13 due to tidal influence on the river flows.

Because these RC piers are the ones supporting the steel deck truss main span they should be monitored for any scour conditions that could affect their integrity.

INSPECTION COMMENTARY

Column 2 in Bent 14, the north half of the north concrete tower, has an incipient spall along its northeast corner. The spall is located about 20 feet above the ground, and measures about 24 inches tall by 12 inches wide. See photos No. 11 & 12, dated 01/16/2014, submitted with this report and available in BIRIS.

The horizontal transverse beam at the base of the legs of Bent 27 has 0.16 to 0.32 inch wide cracks in its sides between Post/Leg 3 and Post/Leg 4. The wood around the cracks/splits is damp and the interior appears to be soft when poked with a knife or awl. See photos No. 17 & 18, dated 10/06/2011, available in BIRIS. The member was drilled with an auger bit and found to be decayed in the core. The condition was only present in the area between the vertical members. When the beam was drilled under the posts no decay was found.

The horizontal transverse beam at the base of the legs of Bent 29 has 0.16 to 0.32 inch wide cracks in its top between Post/Leg 1 and Post/Leg 2, and between Post/Leg 2 and Post/Leg 3. The wood around the cracks/splits is damp and the interior appears to be soft then poked with a knife or awl. See photos No. 19 & 20, dated 10/06/2011, available in BIRIS.

There are patches of poison oak growing adjacent to the columns at the north end of the bridge under and beside the last three to four spans.

SAFE LOAD CAPACITY

A Structure Rating Data Sheet, dated 11/01/2011, is on file for this structure. While this report does not include a check of that analysis, it does verify that the structural conditions observed during this inspection are consistent with those assumed in that analysis. The current ratings are based on Midas computer program output, dated 10/20/2011.

The steel deck truss main span and the timber trestle approach spans were analyzed separately; the main span was found to have lower Inventory, Operating, and Permit Ratings than the approach spans, and therefore, to be the controlling portion of the structure. The load rating values shown are for the main span.

MISCELLANEOUS

The main span is a riveted steel deck truss that was recycled from an old bridge that had been located on the South Fork of the Feather River approximately 1.5 miles downstream of Bidwell Bar.

Recommendations to repair or replace portions or all of the structure have been added to the backlog of Outstanding Work for this bridge over more than 20 years. The district established an Expenditure Authorization (EA), 01-40110X, in April 1999 to address many of these issues. A partial listing includes:

- 1.) Replace the wood bridge rail.
- 2.) Remove and replace the bolted connections and hardware throughout the entire timber sub-structure.
- 3.) Replace the steel main span.
- 4.) Or, replace the entire structure.

This project has been included in the district's 2012 SHOPP Plan. It is programmed for funding; the EA is currently active with the contract tentatively scheduled to be advertised in June 2016. No work is under way at this time to deal with most of the outstanding Work Recommendations that have been consolidated under this EA.

A Structure Maintenance & Investigations Peer Review in August 2007 unanimously

INSPECTION COMMENTARY

reaffirmed replacement of the structure as the preferred engineering and most fiscally responsible alternative to ensure the safety and reliability of this critical link of the state highway system. The decision to recommend replacement was based on the significant cost to upgrade the bridge and the need for future preventive maintenance, including continual replacement of the bolted connectors of the timber towers and repainting the truss of the main span of the structure every five to ten years. The district should proceed with complete replacement of this structure.

This structure has been designated "Structurally Deficient" because the 'Deck' (Item 58 on the Structure Inventory and Appraisal Report sheet) is rated a "4". The poor Condition Rating of the 'Deck' is due to the Timber Deck with AC Overlay (Element 32 in the ELEMENT INSPECTION RATINGS table) being in Condition State 3. Major rehabilitation (or replacement) is required to improve the Condition State of the element, which will raise the Condition Rating, which will remove the "Structurally Deficient" status and improve the Sufficiency Rating.

STEEL INVESTIGATIONS

This structure qualifies for an in-depth Steel investigation because it possesses the following fracture critical or fatigue prone details :

Truss: FC Members with Category E Welds

Fracture Critical: Yes

Inspection Freq.: 24

Next Inspection: 03/22/2014

ELEMENT INSPECTION RATINGS

Element Group: 101 - Approach - Southern Spans 1-11 - Timber Deck Trusses

Elem No.	Element Description	Env	Total Qty	Units	Qty in each Condition State				
					St. 1	St. 2	St. 3	St. 4	St. 5
32	Timber Deck - w/ AC Overlay	3	644	sq.m	0	0	644	0	0
117	Timber Stringer	3	1332	m.	1332	0	0	0	0
135	Timber Truss/Arch	2	80	m.	80	0	0	0	0
156	Timber Floor Beam	2	69	m.	69	0	0	0	0
205	Reinforced Conc Column or Pile Extension	3	2	ea.	0	2	0	0	0
206	Timber Column or Pile Extension	3	45	ea.	0	45	0	0	0
215	Reinforced Conc Abutment	3	11	m.	11	0	0	0	0
227	Reinforced Conc Submerged Pile	2	1	ea.	1	0	0	0	0
228	Timber Submerged Pile	2	1	ea.	1	0	0	0	0
234	Reinforced Conc Cap	3	5	m.	5	0	0	0	0
235	Timber Cap	3	91	m.	91	0	0	0	0
332	Timber Bridge Railing	3	150	m.	150	0	0	0	0

Element Group: 102 - Main - Main Span - Steel Deck Truss

Elem No.	Element Description	Env	Total Qty	Units	Qty in each Condition State				
					St. 1	St. 2	St. 3	St. 4	St. 5
32	Timber Deck - w/ AC Overlay	3	341	sq.m	0	0	341	0	0
117	Timber Stringer	3	543	m.	543	0	0	0	0
131	Painted Steel Deck Truss	4	79	m.	79	0	0	0	0
205	Reinforced Conc Column or Pile Extension	3	4	ea.	0	3	1	0	0
227	Reinforced Conc Submerged Pile	2	1	ea.	1	0	0	0	0
228	Timber Submerged Pile	2	1	ea.	1	0	0	0	0
234	Reinforced Conc Cap	3	17	m.	17	0	0	0	0

Element Group: 102 - Main - Main Span - Steel Deck Truss									
Elem No.	Element Description	Env	Total Qty	Units	Qty in each Condition State				
					St. 1	St. 2	St. 3	St. 4	St. 5
304	Open Expansion Joint	2	17	m.	17	0	0	0	0
311	Moveable Bearing (roller, sliding, etc.)	4	2	ea.	2	0	0		
313	Fixed Bearing	4	2	ea.	2	0	0		
332	Timber Bridge Railing	2	79	m.	79	0	0	0	0
363	Section Loss	4	1	ea.	1	0	0	0	0
Element Group: 103 - Approach - Northern Spans 13-34 - Timber Deck Trusses									
Elem No.	Element Description	Env	Total Qty	Units	Qty in each Condition State				
					St. 1	St. 2	St. 3	St. 4	St. 5
32	Timber Deck - w/ AC Overlay	2	1544	sq.m	0	0	1544	0	0
117	Timber Stringer	2	3197	m.	3197	0	0	0	0
135	Timber Truss/Arch	2	323	m.	323	0	0	0	0
156	Timber Floor Beam	2	250	m.	250	0	0	0	0
205	Reinforced Conc Column or Pile Extension	2	2	ea.	1	1	0	0	0
206	Timber Column or Pile Extension	2	90	ea.	90	0	0	0	0
215	Reinforced Conc Abutment	2	11	m.	11	0	0	0	0
228	Timber Submerged Pile	2	1	ea.	1	0	0	0	0
234	Reinforced Conc Cap	2	5	m.	5	0	0	0	0
235	Timber Cap	2	176	m.	176	0	0	0	0
332	Timber Bridge Railing	2	358	m.	358	0	0	0	0

WORK RECOMMENDATIONS

RecDate: 01/16/2014	EstCost: \$5,200	Repair Column 2 in Bent 14, the north half of the north concrete tower, where there is an incipient spall along its northeast corner. The spall is located about 20 feet above the ground, and measures about 24 inches tall by 12 inches wide.
Action : Sub-Patch spalls	StrTarget: 1 YEAR	
Work By: BRIDGE CREW	DistTarget:	
Status : PROPOSED	EA:	
RecDate: 10/06/2011	EstCost: \$150,000	Repair (remove and replace and/or supplement) all portions of the horizontal transverse beam at the base of the legs of Bent 27 & 29 where the wood is decayed in the interior. Portions of the members were drilled with an auger bit and found to be decayed in the core.
Action : Sub-Misc.	StrTarget: 1 YEAR	
Work By: MAINT. CONTRACT	DistTarget:	
Status : INITIATED	EA: 0E200	
RecDate: 10/06/2011	EstCost: \$228,600	There are numerous repaired, patched, and cracked and raveled areas in both lanes in nearly all spans. The cracking, raveling, and potholing of the AC indicates that the timber two-layer plank deck under the AC is rotting and crushing, causing the failure of the AC riding surface. The timber plank deck appears to have reached the end of its
Action : Deck-Rehab	StrTarget: 1 YEAR	
Work By: MAINT. CONTRACT	DistTarget:	
Status : INITIATED	EA: 0E200	

WORK RECOMMENDATIONS

RecDate: 09/25/2007	EstCost:	service life. Remove the AC; remove and replace any deteriorated timber planks; place a new waterproof membrane on the timber planks; place a new course of AC on the membrane.
Action : Remove Vegetation	StrTarget: 2 YEARS	
Work By: DISTRICT	DistTarget:	
Status : PROPOSED	EA:	Eradicate the patches of poison oak growing adjacent to the columns at the north end of the bridge under and beside the last three to four spans.

RecDate: 03/28/2007	EstCost: \$1,270,000	Steel truss members may require strengthening. Priority 4. Final Score 2.8125.
Action : Seismic-Retrofit	StrTarget: 2 YEARS	
Work By: STRAIN	DistTarget:	
Status : PROGRAMMED	EA: 40110K	

RecDate: 11/06/2002	EstCost: \$750,000	Continue the ongoing program of replacement of timber fasteners. Remove and replace the bolted connections and hardware (threaded rods, malleys, nuts, splice plates/straps, scabs, etc.) throughout the entire timber sub-structure.
Action : Sub-Misc.	StrTarget: 2 YEARS	
Work By: MAINT. CONTRACT	DistTarget:	
Status : INITIATED	EA: 0E200	

RecDate: 04/05/1999	EstCost: \$13,200,000	Replace the steel main span. Estimated at \$2,000,000 (NOT including traffic handling costs). Or, replace the entire structure. Estimated at \$13,200,000.
Action : Bridge-Replace	StrTarget: 2 YEARS	
Work By: STRAIN	DistTarget:	
Status : PROGRAMMED	EA: 40110K	

THIS AGING STRUCTURE IS IN A MARGINAL AND DETERIORATING CONDITION. IT IS FUNCTIONALLY OBSOLETE, HAS A LOW LOAD RATING, AND IS AN INAPPROPRIATE DESIGN FOR THE ENVIRONMENT. THE LIFE CYCLE ECONOMIC COST OF ADEQUATE MAINTENANCE DOES NOT COMPARE FAVORABLY WITH COST OF REPLACEMENT WITH A STRUCTURE TYPE BETTER SUITED TO THE ENVIRONMENT.

IT IS THEREFORE URGENTLY RECOMMENDED THAT THIS STRUCTURE BE REPLACED. AN SM&I PEER REVIEW IN AUGUST 2007 REAFFIRMED THE RECOMMENDATION THAT THIS BRIDGE BE REPLACED.

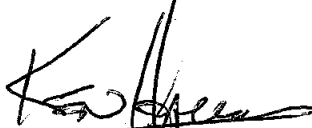
RecDate: 07/01/1986	EstCost: \$1,500,000	Remove and replace the bolted connections and hardware (threaded rods, malleys, nuts, splice plates/straps, etc) throughout the entire timber sub-structure. Replace the top left horizontal timber element between Bent 15 and Bent 16.
Action : Sub-Rehab	StrTarget: 2 YEARS	
Work By: STRAIN	DistTarget:	
Status : PROGRAMMED	EA: 40110K	

WORK RECOMMENDATIONS

RecDate: 02/10/1984 EstCost: \$1,008,600 F1-10 / F2-6 / F3-1 / Rail Type-WOOD.
Action : Railing-Upgrade StrTarget: 2 YEARS Replace the bridge rail.
Work By: STRAIN DistTarget:
Status : PROGRAMMED EA: 40110K

Team Leader : Tim Sandoval
Report Author : Tim Sandoval
Inspected By : T.Sandoval/K.Hallis



 6/16/2014
Ken Hallis (Registered Civil Engineer) (Date)

STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 10 0136
 (5) INVENTORY ROUTE (ON/UNDER) - ON 131000010
 (2) HIGHWAY AGENCY DISTRICT 01
 (3) COUNTY CODE 045 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- ALBION RIVER
 (7) FACILITY CARRIED- STATE ROUTE 1
 (9) LOCATION- 01-MEN-001-43.74
 (11) MILEPOINT/KILOMETERPOINT 43.74
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000101
 (16) LATITUDE 39 DEG 13 MIN 35.2 SEC
 (17) LONGITUDE 123 DEG 46 MIN 08.55 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

***** STRUCTURE TYPE AND MATERIAL *****

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL
 TYPE- TRUSS - DECK CODE 309
 (44) STRUCTURE TYPE APPR:MATERIAL- WOOD OR TIMBER
 TYPE- STRINGER/MULTI-BEAM OR GDR CODE 702
 (45) NUMBER OF SPANS IN MAIN UNIT 1
 (46) NUMBER OF APPROACH SPANS 33
 (107) DECK STRUCTURE TYPE- TIMBER CODE 8
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- BITUMINOUS CODE 6
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

***** AGE AND SERVICE *****

(27) YEAR BUILT 1944
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY 1
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 2100
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 6 %
 (19) BYPASS, DETOUR LENGTH 51 KM

***** GEOMETRIC DATA *****

(48) LENGTH OF MAXIMUM SPAN 39.6 M
 (49) STRUCTURE LENGTH 295.4 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.9 M
 (52) DECK WIDTH OUT TO OUT 8.6 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 7.3 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 0 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 7.9 M
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 M
 (54) MIN VERT UNDERCLEAR REF- NOT H/RR 0.00 M
 (55) MIN LAT UNDERCLEAR RT REF- NOT H/RR 0.0 M
 (56) MIN LAT UNDERCLEAR LT 0.0 M

***** NAVIGATION DATA *****

(38) NAVIGATION CONTROL- BR PERMIT REQ CODE 1
 (111) PIER PROTECTION- NOT REQUIRED CODE 1
 (39) NAVIGATION VERTICAL CLEARANCE 50.0 M
 (116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR M
 (40) NAVIGATION HORIZONTAL CLEARANCE 35.7 M

***** SUFFICIENCY RATING *****

SUFFICIENCY RATING = 63.9
 STATUS FUNCTIONALLY OBSOLETE
 HEALTH INDEX 93.5
 PAINT CONDITION INDEX = 100.0

***** CLASSIFICATION *****

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL RURAL 06
 (100) DEFENSE HIGHWAY- NOT STRAHNET 0
 (101) PARALLEL STRUCTURE- NONE EXISTS N
 (102) DIRECTION OF TRAFFIC- 2 WAY 2
 (103) TEMPORARY STRUCTURE-
 (105) FED.LANDS HWY- NOT APPLICABLE 0
 (110) DESIGNATED NATIONAL NETWORK - NOT ON NET 0
 (20) TOLL- ON FREE ROAD 3
 (21) MAINTAIN- STATE HIGHWAY AGENCY 01
 (22) OWNER- STATE HIGHWAY AGENCY 01
 (37) HISTORICAL SIGNIFICANCE- ELIGIBLE 2

***** CONDITION *****

(58) DECK 5
 (59) SUPERSTRUCTURE 7
 (60) SUBSTRUCTURE 7
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING *****

(31) DESIGN LOAD- M-13.5 OR H-15 2
 (63) OPERATING RATING METHOD- LOAD FACTOR 1
 (64) OPERATING RATING- 30.8
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1
 (66) INVENTORY RATING- 22.7
 (70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
 (41) STRUCTURE OPEN, POSTED OR CLOSED- A
 DESCRIPTION- OPEN, NO RESTRICTION

***** APPRAISAL *****

(67) STRUCTURAL EVALUATION 6
 (68) DECK GEOMETRY 3
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 0010
 (113) SCOUR CRITICAL BRIDGES 5

***** PROPOSED IMPROVEMENTS *****

(75) TYPE OF WORK- DECK REPLACEMENT CODE 37
 (76) LENGTH OF STRUCTURE IMPROVEMENT 295.4 M
 (94) BRIDGE IMPROVEMENT COST \$2,540,000
 (95) ROADWAY IMPROVEMENT COST \$508,000
 (96) TOTAL PROJECT COST \$4,267,200
 (97) YEAR OF IMPROVEMENT COST ESTIMATE 2010
 (114) FUTURE ADT 5080
 (115) YEAR OF FUTURE ADT 2031

***** INSPECTIONS *****

(90) INSPECTION DATE 01/14 (91) FREQUENCY 24 MO
 (92) CRITICAL FEATURE INSPECTION: (93) CFI DATE
 A) FRACTURE CRIT DETAIL- YES 24 MO A) 03/12
 B) UNDERWATER INSP- NO MO B)
 C) OTHER SPECIAL INSP- NO MO C)



Photo No. 1
Looking south at repaired portion of riding surface of northbound lane over approach span



Photo No. 2
Looking north at repaired portion of riding surface of southbound lane over approach span



Photo No. 3
Looking south from Bent 13 at recently painted steel members of the main span deck truss



Photo No. 4
Looking north from Bent 12 at recently painted steel members of the main span deck truss



Photo No. 5
Looking down at location of broken bolt at Bent 17 where diagonal brace meets Column 3



Photo No. 6
Looking easterly at bolted connection adjacent to Column 4 in Bent 23- nut is missing



Photo No. 7
Looking down at beam in Span 23 adjacent to Bent 24 - core rot in member



Photo No. 8
Looking down at mid-point of beam in Span 24 - half of the nuts are severely corroded



Photo No. 9

Looking over at beam in Span 31 adjacent to Bent 32 - core rot in horizontal member



Photo No. 10
Looking up at bolted connection in Span 14- nut is severely corroded



Photo No. 11
Looking up at incipient spall about 20 feet up at northeast corner of Column 2 in Bent 14



Photo No. 12

Looking up at incipient spall about 20 feet up at northeast corner of Column 2 in Bent 14



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 10 0136
Facility Carried: STATE ROUTE 1
Location : 01-MEN-001-43.74
City :
Inspection Date : 10/06/2011

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

☒

STRUCTURE NAME: ALBION RIVER

CONSTRUCTION INFORMATION

Year Built : 1944 Skew (degrees): 0
Year Widened: N/A No. of Joints : 2
Length (m) : 295.4 No. of Hinges : 0

Structure Description: Simply supported 34-span bridge. Timber 2-ply plank deck, with AC riding surface, timber 17-stringer spans on timber A-frame deck trusses on timber tower bents. Eleven timber approach spans at the south end of the bridge, with Span 8 & 10 being a timber A-frame deck truss. A single-span riveted steel deck truss on RC tower bents over the main channel. Twenty-two timber approach spans at the north end of the bridge, with Span 14, 16, 18, 20, 22, 24, 26, 28, & 30 being a timber A-frame deck truss. Both abutments are RC buttress-type 3-column bents on spread footings. Foundations for Bents 2-10 & 27-34 are concrete pedestal-type spread footings, Tower 11-12 is on driven PC/RC piles and Tower 13-14 is on driven timber piles, Bents 15-26 are concrete pedestal-type footings on driven timber piles. (The main span is a riveted steel deck truss that was recycled from an old bridge that had been located on the South Fork of the Feather River approximately 1.5 mi. downstream of Bidwell Bar) All timber is treated Douglas Fir (from Washington State).

Span Configuration : 7@ 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.03 m (16.5 ft.), 39.62 m (130.0 ft.), 5.03 m (16.5 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 4 @ 5.79 m (19.0 ft.)

LOAD CAPACITY AND RATINGS

Design Live Load: M-13.5 OR H-15
Inventory Rating: 30.8 metric tonnes Calculation Method: ALLOWABLE STRESS
Operating Rating: 51.2 metric tonnes Calculation Method: ALLOWABLE STRESS
Permit Rating : POOXX
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: 0.08 m (0.3 ft.) br, 0.30 m (1.0 ft.) wg, 7.92 m (26.0 ft.), 0.30 m (1.0 ft.) wg, 0.08 m (0.3 ft.) br
Total Width: 8.6 m Net Width: 7.9 m No. of Lanes: 2
Rail Description: Timber railings on timber posts, with timber wheel guard in front Rail Code : 0010
Min. Vertical Clearance: Unimpaired

DESCRIPTION UNDER STRUCTURE

Channel Description: Wide, sandy bed on flat slope situated in bottom of relatively narrow canyon at outlet to the ocean. Tidally influenced; flow reversal.
Bridge is on straight reach downstream of right bend, about 180 m from the outlet to the ocean.

INSPECTION COMMENTARY

INSPECTION ACCESS

The deck, superstructure, and substructure were visually inspected on foot from the ground and the catwalk. The underside of the superstructure and the substructure of Spans 1 through 5 were viewed from the ground underneath; the catwalk of the superstructure was walked from the south end to the north end and back again in order to view the underside of the superstructure of Spans 6 through 32. The underside of the superstructure and the substructure of Spans 33 and 34 were viewed from the ground underneath. Towers 7-8 and 9-10 were inaccessible because of the tall, steep slope of the terrain and the dense vegetation - including poison oak. The base of both main-span towers was out of the water. The water level in the river under Span 12 was approximately 1.8 to 2.4 m (6 to 8 ft.). Minor local scour was observed on the river side of both towers. The base of Towers 15-16, 17-18, 19-20, 21-22, 23-24, 25-26, and 27-28 were inspected from the ground around them. Towers 29-30 and 31-32 were inaccessible because of the tall, steep slope of the terrain and the dense vegetation - including poison oak.

CONDITION OF STRUCTURE

DECK AND RAILS

The AC on the deck in Span 1 and 2 has multiple 0.6 to 0.9 m (2-3 ft.) diameter patches where potholes had occurred in both lanes. (See photo No. 5 dated 10/06/11 submitted with this report and available in BIRIS.)

The AC of the southbound lane in Span 3 and 4 has map pattern cracks and raveling. (See photo No. 6 dated 10/06/11 submitted with this report and available in BIRIS.)

The AC of the southbound lane in Span 1 has map pattern cracks and raveling. (See photo No. 7 dated 10/06/11 submitted with this report and available in BIRIS.)

There are numerous 0.5 to 2 mm (0.02-0.08 in) wide random cracks in the AC riding surface on the timber deck.

The AC of the north end southbound lane in Span 12, adjacent to the open expansion joint at Bent 13, has patched potholes, map pattern cracks, and raveling. (See photo No. 8 dated 10/06/11 submitted with this report and available in BIRIS.)

The AC of the northbound lane in Span 16 has map pattern cracks and raveling in the right wheel line. It has been repaired, but the pavement immediately adjacent to it continues to crack and ravel. (See photo No. 10 dated 10/06/11 submitted with this report and available in BIRIS.)

There are numerous repaired, patched, and cracked and raveled areas in both lanes in nearly all spans. The cracking, raveling, and potholing of the AC indicates that the timber two-layer plank deck under the AC is rotting and crushing, causing the failure of the AC riding surface. The timber plank deck appears to have reached the end of its service life. (See photos No. 13 & 14 dated 10/06/11 submitted with this report and available in BIRIS.)

The scuppers at the base of the wheel guards on the deck at the north end of the bridge are plugged with dirt and weeds.

SUPERSTRUCTURE

No defects were noted in the timber members. The threaded fasteners are in very poor condition and continue to deteriorate. Access was limited to the timbers and fasteners

INSPECTION COMMENTARY

immediately adjacent to the catwalk. Even so, it was obvious that the marine environment has caused near total corrosion of a large number of the nuts on the threaded rods that hold the timbers in place.

SUBSTRUCTURE

The condition of the structure elements of this bridge below the catwalk could not be properly evaluated during this routine inspection due to the height of the timber towers (over 100 ft tall on average). Only the timbers and fasteners at the base of the bents could be properly examined.

The horizontal transverse beam at the base of the legs of Bent 27 has 4 to 8 mm (0.16-0.32 in) wide cracks in its sides between Post/Leg 3 and Post/Leg 4. The wood around the cracks/splits is damp and the interior appears to be soft when poked with a knife or awl. (See photos No. 17 & 18 dated 10/06/11 submitted with this report and available in BIRIS.) The member was drilled with an auger bit and found to be decayed in the core. The condition was only present in the area between the vertical members. When the beam was drilled under the posts no decay was found.

The horizontal transverse beam at the base of the legs of Bent 29 has 4 to 8 mm (0.16-0.32 in) wide cracks in its top between Post/Leg 1 and Post/Leg 2, and between Post/Leg 2 and Post/Leg 3. The wood around the cracks/splits is damp and the interior appears to be soft then poked with a knife or awl. (See photos No. 19 & 20 dated 10/06/11 submitted with this report and available in BIRIS.)

CLIMB INVESTIGATION

The bridge was closely inspected in April 1999 utilizing the SM&I Climb Team. The underside of the superstructure and the substructure were given a thorough visual inspection. The 1999 findings are as follows:

The bolted connections are acting as pins, and as long as they are in place, the bridge is in sound condition. If the nuts that retain the bolts should fail, there is a possibility that bolts will slide out of the connections as the timber members shift. Currently, approximately 30% of the nuts of the bolted connections in the towers are in unsatisfactory condition due to corrosion from the marine environment. Based on the configuration of the timber bents, it has been determined that there are 50 bolts in the top horizontals, 60 bolts at the intermediate horizontals, 8 bolts in the intermediate cross-braces and 114 bolts in the bases; (and depending on the height) the quantities are as follows:

Bents 2-3, 4-5, and 6: 100 bolts.

Bents 7-8: 178 bolts.

Bents 9-10: 436 bolts.

Bents 15-16, 17-18, 19-20, 21-22 and 23-24: 2,560 bolts (512 per tower bent).

Bents 25-26 and 27-28: 888 bolts (444 per tower bent).

Bents 29-30: 379 bolts.

Bents 31-32: 178 bolts.

Bents 33-34: 100 bolts.

Total: 4,819 bolts. Estimate 5,000 bolts and nuts for contract purposes.

Until the work is completed, the Bridge Crew should closely monitor the integrity of the connections and continue as before in replacing fasteners as needed.

There is a 15 cm (6 in.) diameter spall with an exposed and corroded steel reinforcing bar on the east side of the south wall of the base of Tower 13-14.

INSPECTION COMMENTARY

There are patches of poison oak growing adjacent to the columns at the north end of the bridge under and beside the last three to four spans.

A climb team comprised of personnel from the Toll Bridges Investigations Office is tentatively scheduled to inspect all timber structure members in May 2012. The inspection plan includes close visual and auditory reconnaissance of the full length and all sides of every piece of wood. Any suspect members will be drilled to verify their integrity; and, if found to be deficient, the location, amount, and severity of any decay found will be documented and remediated.

PAINT CONDITION

The main span steel deck truss is heavily rusted. The protective system applied (in October 2000) to this structure is failing. The paint has broken down in many places on the steel span. The paint system has failed under the assault of the marine environment.

Corrosion has caused section loss in several elements of the top bracing (see the description under heading FRACTURE CRITICAL INVESTIGATION). Layers of paint over expansive corrosion prevent an accurate measurement of the amount of section loss. (See photos No. 15 & 16 dated 10/06/11 submitted with this report and available in BIRIS.)

Spot rust and localized surface pitting with minimal or no section loss is present in most other truss elements and around the connections. No pack rust was found in the connections.

FRACTURE CRITICAL INVESTIGATION

This structure is fracture critical because of the lack of redundancy of the riveted steel deck truss main span. The Fracture Critical Investigation Team is responsible for inspection of the fracture critical steel elements of this bridge. The most recent Fracture Critical Investigation performed on this structure was on 03/24/10 using the Under Bridge Inspection Truck. The inspection of this structure consisted of an overall visual inspection with the following conditions noted:

Moderate-to-heavy expansive corrosion was found along the top chord of the steel trusses. No defect indications were found.

This structure is on a 24-month inspection cycle for Fracture Critical members/elements.

SCOUR

Local scour exists at Piers 12 and 13 due to tidal influence on the river flows.

Because these RC piers are the ones supporting the steel deck truss main span they should be monitored for any scour conditions that could affect their integrity.

SAFE LOAD CAPACITY

This bridge was completed in 1944 and was rated in May 1983 using load factor design for HS20-44 and Permit trucks. The calculations were based on 2.0 inches of AC which is consistent with field conditions. The bridge has an inventory rating factor of 0.95 (30.8 metric tons), an operating rating factor of 1.58 (51.2 metric tons), and a permit rating factor of 0.63 for a 13 axle permit truck based on load factor design. It is rated safe for all legal loads and POOXX for permit loads.

INSPECTION COMMENTARY**MISCELLANEOUS**

The main span is a riveted steel deck truss that was recycled from an old bridge that had been located on the South Fork of the Feather River approximately 2.5 km (1.5 mi.) downstream of Bidwell Bar. The strategy of encapsulating rust by multiple coats of paint has reached the end of its useful life. Due to the thickness of the paint system, it is difficult to determine the extent of section loss in the steel members. The heavy build up of paint precludes early detection of potential fatigue cracking.

Recommendations to repair or replace portions or all of the structure have been added to the backlog of Outstanding Work for this bridge over more than 20 years. The district established an Expenditure Authorization (EA), 01-40110X, in April 1999 to address many of these issues. A partial listing includes:

- 1.) Replace the wood bridge rail.
- 2.) Remove and replace the bolted connections and hardware throughout the entire timber sub-structure.
- 3.) Replace the top left horizontal timber element between Bent 15 and Bent 16.
- 4.) Remove the existing paint system from the steel main span to allow for fracture critical inspections and then repaint.
- 5.) Replace the steel main span.
- 6.) Or, replace the entire structure.

This project has been included in the district's 2012 SHOPP Plan. It is programmed for funding; the EA is currently active with the contract tentatively scheduled to be awarded in fiscal year 2016. No work is under way at this time to deal with most of the outstanding Work Recommendations that have been consolidated under this EA.

A Structure Maintenance & Investigations Peer Review in August 2007 unanimously reaffirmed replacement of the structure as the preferred engineering and most fiscally responsible alternative to ensure the safety and reliability of this critical link of the state highway system. The decision to recommend replacement was based on the significant cost to upgrade the bridge and the need for future preventive maintenance, including continual replacement of the bolted connectors of the timber towers and repainting the truss of the main span of the structure every five years. The district should proceed with complete replacement of this structure.

<u>ELEMENT INSPECTION RATINGS</u>									
Element Group: 101 - ELI Frame - ELI Frame - ELI Frame									
Elem No.	Element Description	Env	Total Qty	Units	Qty in each Condition State				
					St. 1	St. 2	St. 3	St. 4	St. 5
32	Timber Deck - w/ AC Overlay	3	2200	sq.m.	0	2200	0	0	0
117	Timber Stringer	3	5092	m.	5092	0	0	0	0
205	Reinforced Conc Column or Pile Extension	3	4	ea.	0	4	0	0	0
206	Timber Column or Pile Extension	3	134	ea.	0	134	0	0	0
215	Reinforced Conc Abutment	3	17	m.	17	0	0	0	0
227	Reinforced Conc Submerged Pile	2	1	ea.	1	0	0	0	0
228	Timber Submerged Pile	2	1	ea.	1	0	0	0	0
234	Reinforced Conc Cap	3	17	m.	17	0	0	0	0
235	Timber Cap	3	248	m.	248	0	0	0	0
304	Open Expansion Joint	2	17	m.	17	0	0	0	0

Element Group: 101 - Eli Frame - ELI Frame - ELI Frame									
Elem	Total			Qty in each Condition State					
No.	Element Description	Env	Qty	Units	St. 1	St. 2	St. 3	St. 4	St. 5
332	Timber Bridge Railing	3	591	m.	591	0	0	0	0
358	Deck Cracking	2	1	ea.	0	1	0	0	0
361	Scour	2	1	ea.	0	1	0	0	0
363	Section Loss	4	1	ea.	0	1	0	0	0
Element Group: 102 - Default Structure Unit									
Elem	Total			Qty in each Condition State					
No.	Element Description	Env	Qty	Units	St. 1	St. 2	St. 3	St. 4	St. 5
32	Timber Deck - w/ AC Overlay	3	341	sq.m.	0	341	0	0	0
117	Timber Stringer	3	543	m.	543	0	0	0	0
131	Painted Steel Deck Truss	4	79	m.	0	0	0	79	0
152	Painted Steel Floor Beam	4	55	m.	0	55	0	0	0
205	Reinforced Conc Column or Pile Extension	3	4	ea.	0	4	0	0	0
227	Reinforced Conc Submerged Pile	2	1	ea.	1	0	0	0	0
228	Timber Submerged Pile	2	1	ea.	1	0	0	0	0
234	Reinforced Conc Cap	3	17	m.	17	0	0	0	0
311	Moveable Bearing (roller, sliding, etc.)	4	2	ea.	0	2	0	0	0
313	Fixed Bearing	4	2	ea.	0	2	0	0	0

WORK RECOMMENDATIONS

RecDate: 10/06/2011 Action : Deck-Rehab Work By: MAINT. CONTRACT Status : PROPOSED	EstCost: \$228,600 StrTarget: 1 YEAR DistTarget: EA:	There are numerous repaired, patched, and cracked and raveled areas in both lanes in nearly all spans. The cracking, raveling, and potholing of the AC indicates that the timber two-layer plank deck under the AC is rotting and crushing, causing the failure of the AC riding surface. The timber plank deck appears to have reached the end of its service life. Remove the AC; remove and replace any deteriorated timber planks; place a new waterproof membrane on the timber planks; place a new course of AC on the membrane.
RecDate: 10/06/2011 Action : Sub-Misc. Work By: MAINT. CONTRACT Status : PROPOSED	EstCost: \$10,000 StrTarget: 1 YEAR DistTarget: EA:	Repair (remove and replace and/or supplement) all portions of the horizontal transverse beam at the base of the legs of Bent 27 & 29 where the wood is decayed in the interior. Portions of the members were drilled with an auger bit and found to be decayed in the core.
RecDate: 09/25/2007 Action : Remove Vegetation Work By: DISTRICT Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Eradicate the patches of poison oak growing adjacent to the columns at the north end of the bridge under and beside the last three to four spans.

WORK RECOMMENDATIONS

RecDate: 03/28/2007	EstCost: \$1,270,000	Steel truss members may require
Action : Seismic-Retrofit	StrTarget: 2 YEARS	strengthening. Priority 4. Final Score
Work By: STRAIN	DistTarget:	2.8125.
Status : PROGRAMMED	EA: 40110K	
RecDate: 11/06/2002	EstCost: \$20,000	Continue the ongoing program of
Action : Sub-Misc.	StrTarget: 2 YEARS	replacement of timber fasteners.
Work By: BRIDGE CREW	DistTarget:	
Status : PROPOSED	EA:	
RecDate: 04/05/1999	EstCost: \$13,200,000	Replace the steel main span. Estimated
Action : Bridge-Replace	StrTarget: 2 YEARS	at \$2,000,000 (NOT including traffic
Work By: STRAIN	DistTarget:	handling costs). Or, replace the entire
Status : PROGRAMMED	EA: 40110K	structure. Estimated at \$13,200,000.

THIS AGING STRUCTURE IS IN A MARGINAL AND DETERIORATING CONDITION. IT IS FUNCTIONALLY OBSOLETE, HAS A LOW LOAD RATING, AND IS AN INAPPROPRIATE DESIGN FOR THE ENVIRONMENT. THE LIFE CYCLE ECONOMIC COST OF ADEQUATE MAINTENANCE DOES NOT COMPARE FAVORABLY WITH COST OF REPLACEMENT WITH A STRUCTURE TYPE BETTER SUITED TO THE ENVIRONMENT.

IT IS THEREFORE URGENTLY RECOMMENDED THAT THIS STRUCTURE BE REPLACED. AN SM&I PEER REVIEW IN AUGUST 2007 REAFFIRMED THE RECOMMENDATION THAT THIS BRIDGE BE REPLACED.

RecDate: 04/05/1999	EstCost: \$330,050	The strategy of encapsulating rust by
Action : Paint-Full Prep	StrTarget: 2 YEARS	multiple over coating of the paint system
Work By: MAINT. CONTRACT	DistTarget:	has reached the end of its useful life.
Status : PROGRAMMED	EA: 0A590	Due to the thickness of the paint system,
		it is difficult to determine the extent
		of section loss in the steel members.
		The heavy build up of paint precludes
		early detection of potential fatigue
		cracking. Remove the existing paint
		system from the steel main span, to allow
		for fracture critical inspections, and
		then repaint. Estimated at 9,500 square
		feet x \$35 per sq. ft. = \$332,500 (NOT
		including traffic handling costs).

RecDate: 07/01/1986	EstCost: \$1,500,000	Remove and replace the bolted connections
Action : Sub-Rehab	StrTarget: 2 YEARS	and hardware (threaded rods, malleys,
Work By: STRAIN	DistTarget:	nuts, plates, etc) throughout the entire
Status : PROGRAMMED	EA: 40110K	timber sub-structure. Replace the top
		left horizontal timber element between
		Bent 15 and Bent 16.

WORK RECOMMENDATIONS

RecDate: 02/10/1984 EstCost: \$1,008,600 F1-10 / F2-6 / F3-1 / Rail Type-WOOD.
Action : Railing-Upgrade StrTarget: 2 YEARS Replace the bridge rail.
Work By: STRAIN DistTarget:
Status : PROGRAMMED EA: 40110K

Inspected By : T.Sandoval/C.Cronin

Colman Cronin (Registered Civil Engineer)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 10 0136
 (5) INVENTORY ROUTE(ON/UNDER)- ON 131000010
 (2) HIGHWAY AGENCY DISTRICT 01
 (3) COUNTY CODE 045 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- ALBION RIVER
 (7) FACILITY CARRIED- STATE ROUTE 1
 (9) LOCATION- 01-MEN-001-43.74
 (11) MILEPOINT/KILOMETERPOINT 43.74
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000101
 (16) LATITUDE 39 DEG 13 MIN 35.2 SEC
 (17) LONGITUDE 123 DEG 46 MIN 08.55 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

***** STRUCTURE TYPE AND MATERIAL *****

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL
 TYPE- TRUSS - DECK CODE 309
 (44) STRUCTURE TYPE APPR:MATERIAL- WOOD OR TIMBER
 TYPE- STRINGER/MULTI-BEAM OR GDR CODE 702
 (45) NUMBER OF SPANS IN MAIN UNIT 1
 (46) NUMBER OF APPROACH SPANS 33
 (107) DECK STRUCTURE TYPE- TIMBER CODE 8
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- BITUMINOUS CODE 6
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

***** AGE AND SERVICE *****

(27) YEAR BUILT 1944
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY 1
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 2100
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 6 %
 (19) BYPASS, DETOUR LENGTH 51 KM

***** GEOMETRIC DATA *****

(48) LENGTH OF MAXIMUM SPAN 39.6 M
 (49) STRUCTURE LENGTH 295.4 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.9 M
 (52) DECK WIDTH OUT TO OUT 8.6 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 7.3 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 0 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 7.9 M
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 M
 (54) MIN VERT UNDERCLEAR REF- NOT H/RR 0.00 M
 (55) MIN LAT UNDERCLEAR RT REF- NOT H/RR 0.0 M
 (56) MIN LAT UNDERCLEAR LT 0.0 M

***** NAVIGATION DATA *****

(38) NAVIGATION CONTROL- BR PERMIT REQ CODE 1
 (111) PIER PROTECTION- NOT REQUIRED CODE 1
 (39) NAVIGATION VERTICAL CLEARANCE 50.0 M
 (116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR M
 (40) NAVIGATION HORIZONTAL CLEARANCE 35.7 M

***** SUFFICIENCY RATING *****

SUFFICIENCY RATING = 74.8
 STATUS FUNCTIONALLY OBSOLETE
 HEALTH INDEX 79.4
 PAINT CONDITION INDEX = 35.5

***** CLASSIFICATION ***** CODE

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL RURAL 06
 (100) DEFENSE HIGHWAY- NOT STRAHNET 0
 (101) PARALLEL STRUCTURE- NONE EXISTS N
 (102) DIRECTION OF TRAFFIC- 2 WAY 2
 (103) TEMPORARY STRUCTURE-
 (105) FED.LANDS HWY- NOT APPLICABLE 0
 (110) DESIGNATED NATIONAL NETWORK - NOT ON NET 0
 (20) TOLL- ON FREE ROAD 3
 (21) MAINTAIN- STATE HIGHWAY AGENCY 01
 (22) OWNER- STATE HIGHWAY AGENCY 01
 (37) HISTORICAL SIGNIFICANCE- ELIGIBLE 2

***** CONDITION ***** CODE

(58) DECK 5
 (59) SUPERSTRUCTURE 6
 (60) SUBSTRUCTURE 6
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- M-13.5 OR H-15 2
 (63) OPERATING RATING METHOD- ALLOWABLE STRESS 2
 (64) OPERATING RATING- 51.2
 (65) INVENTORY RATING METHOD- ALLOWABLE STRESS 2
 (66) INVENTORY RATING- 30.8
 (70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
 (41) STRUCTURE OPEN, POSTED OR CLOSED- A
 DESCRIPTION- OPEN, NO RESTRICTION

***** APPRAISAL ***** CODE

(67) STRUCTURAL EVALUATION 6
 (68) DECK GEOMETRY 3
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 0010
 (113) SCOUR CRITICAL BRIDGES 5

***** PROPOSED IMPROVEMENTS *****

(75) TYPE OF WORK- DECK REPLACEMENT CODE 37
 (76) LENGTH OF STRUCTURE IMPROVEMENT 295.4 M
 (94) BRIDGE IMPROVEMENT COST \$2,540,000
 (95) ROADWAY IMPROVEMENT COST \$508,000
 (96) TOTAL PROJECT COST \$4,267,200
 (97) YEAR OF IMPROVEMENT COST ESTIMATE 2010
 (114) FUTURE ADT 5080
 (115) YEAR OF FUTURE ADT 2031

***** INSPECTIONS *****

(90) INSPECTION DATE 10/11 (91) FREQUENCY 24 MO
 (92) CRITICAL FEATURE INSPECTION: (93) CFI DATE
 A) FRACTURE CRIT DETAIL- YES 24 MO A) 03/10
 B) UNDERWATER INSP- NO MO B)
 C) OTHER SPECIAL INSP- NO MO C)



Photo No. 1
Looking ahead on route from the left shoulder of the AC approach roadway near Abutment 1



Photo No. 2
Oblique view of the left side of the bridge from the ground near Abutment 1



Photo No. 3

Looking west at the right side of the south half of the bridge



Photo No. 4

Looking west at the right side of the north half of the bridge



Photo No. 5

Repaired potholes in the AC in the southbound lane of one of the southern approach spans



Photo No. 6
Patched pothole in the AC in the southbound lane of one of the southern approach spans



Photo No. 7
Raveled AC in the southbound lane at expansion joint at south end of the main span - B12



Photo No. 8

Patched & raveled AC in southbound lane at expansion joint at north end of main span - B13



Photo No. 9
Pothole in the AC in the northbound lane of one of the northern approach spans



Photo No. 10

Repaired pothole in the AC in the northbound lane of one of the northern approach spans



Photo No. 11

Repaired pothole in the AC in the northbound lane of one of the northern approach spans



Photo No. 12

Repaired potholes & raveled AC in northbound lane at expansion joint over Bent 12



Photo No. 13
Cracks & repaired potholes in the AC in the northbound lane of the southern approach spans



Photo No. 14
Repaired pothole in the AC in the northbound lane of one of the southern approach spans



Photo No. 15
Looking ahead on route from the catwalk at the deck truss members in the main span



Photo No. 16
Looking up at corrosion on the steel members of the upper chord of the main span truss



Photo No. 17
Looking west at the base of Bent 27 - Note spalls in side of the horizontal member



Photo No. 18

Looking west at the base of Bent 27 - Note damp splits in side of the horizontal member



Photo No. 19
Looking east at the base of Bent 29 - Note damp splits in top of the horizontal member



Photo No. 20

Looking east at the base of Bent 29 - Note damp splits in top of the horizontal member



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 10 0136
Facility Carried: STATE ROUTE 1
Location : 01-MEN-001-43.74
City :
Inspection Date : 10/21/2009

Bridge Inspection Report

Inspection Type

Routine ☒ FC ☐ Underwater ☐ Special ☐ Other ☐

STRUCTURE NAME: ALBION RIVER

CONSTRUCTION INFORMATION

Year Built : 1944 Skew (degrees): 0
Year Widened: N/A No. of Joints : 2
Length (m) : 295.4 No. of Hinges : 0

Structure Description: Simply supported 34-span bridge. Timber 2-ply plank deck, with AC riding surface, timber 17-stringer spans on timber A-frame deck trusses on timber tower bents. Eleven timber approach spans at the south end of the bridge, with Span 8 & 10 being a timber A-frame deck truss. A single-span riveted steel deck truss on RC tower bents over the main channel. Twenty-two timber approach spans at the north end of the bridge, with Span 14, 16, 18, 20, 22, 24, 26, 28, & 30 being a timber A-frame deck truss. Both abutments are RC buttress-type 3-column bents on spread footings. Foundations for Bents 2-10 & 27-34 are concrete pedestal-type spread footings, Tower 11-12 is on driven PC/RC piles and Tower 13-14 is on driven timber piles, Bents 15-26 are concrete pedestal-type footings on driven timber piles. (The main span is a riveted steel deck truss that was recycled from an old bridge that had been located on the South Fork of the Feather River approximately 1.5 mi. downstream of Bidwell Bar) All timber is treated Douglas Fir (from Washington State).

Span Configuration : 7@ 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.03 m (16.5 ft.), 39.62 m (130.0 ft.), 5.03 m (16.5 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 5.79 m (19.0 ft.), 11.58 m (38.0 ft.), 4 @ 5.79 m (19.0 ft.)

LOAD CAPACITY AND RATINGS

Design Live Load: M-13.5 OR H-15
Inventory Rating: 30.8 metric tonnes Calculation Method: ALLOWABLE STRESS
Operating Rating: 51.2 metric tonnes Calculation Method: ALLOWABLE STRESS
Permit Rating : POOXX
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: 0.08 m (0.25 ft.) br, 0.30 m (1.0 ft.) wg, 7.92 m (26.0 ft.), 0.30 m (1.0 ft.) wg, 0.08 m (0.25 ft.) br
Total Width: 8.6 m Net Width: 7.9 m No. of Lanes: 2
Rail Description: Timber railings on timber posts, with timber wheel guard in front Rail Code : 0110
Min. Vertical Clearance: Unimpaired

DESCRIPTION UNDER STRUCTURE

Channel Description: Wide, sandy bed on flat slope situated in bottom of relatively narrow canyon at outlet to the ocean. Tidally influenced; flow reversal.
Bridge is on straight reach downstream of right bend, about 180 m from the outlet to the ocean.

Printed on: Monday 10/18/2010 11:06 AM

10 0136/AAAN/17371

CONDITION TEXT

SCOPE OF INVESTIGATION

The deck, superstructure, and substructure were visually inspected. The underside of the superstructure and the substructure of Spans 1 through 5 were viewed from the ground underneath; the catwalk of the superstructure was walked from the south end to the north end and back again in order to view the underside of the superstructure of Spans 6 through 32. The underside of the superstructure and the substructure of Spans 33 and 34 were viewed from the ground underneath. Towers 7-8 and 9-10 were inaccessible because of the tall, steep slope of the terrain and the dense vegetation - including poison oak. The base of both main-span towers was in the water. The water level in the river under Span 12 was approximately 2.4 to 3.0 m (8 to 10 ft.). Minor local scour was observed on the river side of both towers. The base of Towers 15-16, 17-18, 19-20, 21-22, 23-24, 25-26, and 27-28 were inspected from the ground around them. Towers 29-30 and 31-32 were inaccessible because of the tall, steep slope of the terrain and the dense vegetation - including poison oak.

CONDITION OF STRUCTURE

The following conditions have been noted in previous investigations and have not changed significantly:

The AC on the deck in Span 1 and 2 has a few 0.6-to-0.9 m (2 to 3 ft.) diameter patches where potholes had occurred in both lanes.

The AC of the southbound lane in Span 3 and 4 has map pattern cracks and raveling.

There are numerous moderate (0.5 mm to 2 mm width) random cracks in the AC riding surface on the timber deck.

The AC of the northbound lane in Span 16 has map pattern cracks and raveling in the right wheel line.

The scuppers at the base of the wheel guards on the deck at the north end of the bridge are plugged with dirt and weeds.

There is a 15 cm (6 in.) diameter spall with an exposed and corroded steel reinforcing bar on the east side of the south wall of the base of Tower 13-14.

There are patches of poison oak growing adjacent to the columns at the north end of the bridge under and beside the last three to four spans.

SUBSTRUCTURE INVESTIGATION

The condition of the structure elements of this bridge below the catwalk could not be properly evaluated during this routine inspection due to the height of the timber towers (over 100 ft tall on average). The bridge was closely inspected in April 1999 utilizing the SM&I Climb Team. The underside of the superstructure and the substructure were given a thorough visual inspection. The 1999 findings are as follows:

The bolted connections are acting as pins, and as long as they are in place, the bridge is in sound condition. If the nuts that retain the bolts should fail, there is a possibility that bolts will slide out of the connections as the timber members shift. Currently, approximately 30% of the nuts of the bolted connections in the towers are in unsatisfactory condition due to corrosion from the marine environment. Based on the configuration of the timber bents, it has been determined that there are 50 bolts in the top horizontals, 60 bolts at the intermediate horizontals, 8 bolts in the intermediate

CONDITION TEXT

cross-braces and 114 bolts in the bases; (and depending on the height) the quantities are as follows:

Bents 2-3, 4-5, and 6: 100 bolts.

Bents 7-8: 178 bolts.

Bents 9-10: 436 bolts.

Bents 15-16, 17-18, 19-20, 21-22 and 23-24: 2,560 bolts (512 per tower bent).

Bents 25-26 and 27-28: 888 bolts (444 per tower bent).

Bents 29-30: 379 bolts.

Bents 31-32: 178 bolts.

Bents 33-34: 100 bolts.

Total: 4,819 bolts. Estimate 5,000 bolts and nuts for contract purposes.

Until the work is completed, the Bridge Crew should closely monitor the integrity of the connections and continue as before in replacing fasteners as needed.

PAINT CONDITION

The following conditions have been noted in previous investigations and have not changed significantly:

The main span steel deck truss is heavily rusted. The protective system applied (in October 2000) to this structure is failing. The paint has broken down in many places on the steel span. The paint system has failed under the assault of the marine environment.

Corrosion has caused section loss in several elements of the top bracing (see the description under heading FRACTURE CRITICAL INVESTIGATION). Layers of paint over expansive corrosion prevent an accurate measurement of the amount of section loss.

Spot rust and localized surface pitting with minimal or no section loss is present in most other truss elements and around the connections. No pack rust was found in the connections.

FRACTURE CRITICAL INVESTIGATION

This structure is fracture critical because of the lack of redundancy of the riveted steel deck truss main span. The Fracture Critical Investigation Team is responsible for inspection of the fracture critical steel elements of this bridge. The most recent Fracture Critical Investigation performed on this structure was on 03/25/08 using the Under Bridge Inspection Truck. The inspection of this structure consisted of an overall visual inspection with the following conditions noted:

Moderate-to-heavy expansive corrosion was found along the top chord of the steel trusses. No defect indications were found.

This structure is on a 24-month inspection cycle for Fracture Critical members/elements.

SCOUR

The following condition has been noted in previous investigations and has not changed significantly:

Local scour exists at Piers 12 and 13 due to tidal influence on the river flows.

CONDITION TEXT

Because these RC piers are the ones supporting the steel deck truss main span they should be monitored for any scour conditions that could affect their integrity.

MISCELLANEOUS

The main span is a riveted steel deck truss that was recycled from an old bridge that had been located on the South Fork of the Feather River approximately 2.5 km (1.5 mi.) downstream of Bidwell Bar. The strategy of encapsulating rust by multiple coats of paint has reached the end of its useful life. Due to the thickness of the paint system, it is difficult to determine the extent of section loss in the steel members. The heavy build up of paint precludes early detection of potential fatigue cracking.

Recommendations to repair or replace portions or all of the structure have been added to the backlog of Outstanding Work for this bridge over more than 20 years. The district established an Expenditure Authorization (EA), 01-40110X, in April 1999 to address many of these issues. A partial listing includes:

- 1.) Replace the wood bridge rail.
- 2.) Remove and replace the bolted connections and hardware throughout the entire timber sub-structure.
- 3.) Replace the top left horizontal timber element between Bent 15 and Bent 16.
- 4.) Remove the existing paint system from the steel main span to allow for fracture critical inspections and then repaint.
- 5.) Replace the steel main span.
- 6.) Or, replace the entire structure.

This project was included in the district's Ten Year SHOPP Plan. It has not been programmed for funding; the EA is currently suspended. No work is under way to deal with most of the outstanding Work Recommendations that have been consolidated under this EA, except for Item Number 2 that the district Bridge Maintenance Crew is handling.

A Structure Maintenance & Investigations Peer Review in August 2007 unanimously reaffirmed replacement of the structure as the preferred engineering and most fiscally responsible alternative to ensure the safety and reliability of this critical link of the state highway system. The decision to recommend replacement was based on the significant cost to upgrade the bridge and the need for future preventive maintenance, including continual replacement of the bolted connectors of the timber towers and repainting the truss of the main span of the structure every five years.

<u>ELEMENT INSPECTION RATINGS</u>									
F#Elem	Element Description	Env	Total Units	Qty in each Condition State					
			Qty	St. 1	St. 2	St. 3	St. 4	St. 5	
101 32	Timber Deck - w/ AC Overlay	3	2200 sq.m.	0	2200	0	0	0	0
101 117	Timber Stringer	3	5092 m.	5092	0	0	0	0	0
101 205	Reinforced Conc Column or Pile Extension	3	4 ea.	0	4	0	0	0	0
101 206	Timber Column or Pile Extension	3	134 ea.	0	134	0	0	0	0
101 215	Reinforced Conc Abutment	3	17 m.	17	0	0	0	0	0
101 227	Reinforced Conc Submerged Pile	2	1 ea.	1	0	0	0	0	0
101 228	Timber Submerged Pile	2	1 ea.	1	0	0	0	0	0
101 234	Reinforced Conc Cap	3	17 m.	17	0	0	0	0	0
101 235	Timber Cap	3	248 m.	248	0	0	0	0	0
101 304	Open Expansion Joint	2	17 m.	17	0	0	0	0	0
101 332	Timber Bridge Railing	3	591 m.	591	0	0	0	0	0
101 361	Scour	2	1 ea.	0	1	0	0	0	0

F#Elem	Element Description	Env	Total	Units	Qty in each Condition State				
			Qty		St. 1	St. 2	St. 3	St. 4	St. 5
101 363	Section Loss	4	1	ea.	0	1	0	0	0
102 32	Timber Deck - w/ AC Overlay	3	341	sq.m.	0	341	0	0	0
102 117	Timber Stringer	3	543	m.	543	0	0	0	0
102 131	Painted Steel Deck Truss	4	79	m.	0	0	0	79	0
102 152	Painted Steel Floor Beam	4	55	m.	0	55	0	0	0
102 205	Reinforced Conc Column or Pile Extension	3	4	ea.	0	4	0	0	0
102 227	Reinforced Conc Submerged Pile	2	1	ea.	1	0	0	0	0
102 228	Timber Submerged Pile	2	1	ea.	1	0	0	0	0
102 234	Reinforced Conc Cap	3	17	m.	17	0	0	0	0
102 311	Moveable Bearing (roller, sliding, etc.)	4	2	ea.	0	2	0	0	0
102 313	Fixed Bearing	4	2	ea.	0	2	0	0	0

WORK RECOMMENDATIONS

RecDate: 09/25/2007 Action : Remove Vegetation Work By: DISTRICT Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Eradicate the patches of poison oak growing adjacent to the columns at the north end of the bridge under and beside the last three to four spans.
RecDate: 03/28/2007 Action : Seismic-Retrofit Work By: STRAIN Status : LONG LEAD	EstCost: \$1,270,000 StrTarget: 2 YEARS DistTarget: EA: 40110K	Steel truss members may require strengthening. Priority 4. Final Score 2.8125.
RecDate: 11/06/2002 Action : Sub-Misc. Work By: BRIDGE CREW Status : PROPOSED	EstCost: \$20,000 StrTarget: 2 YEARS DistTarget: EA:	Continue the ongoing program of replacement of timber fasteners.
RecDate: 04/05/1999 Action : Paint-Full prep/Pain Work By: PAINT CREW Status : PROPOSED	EstCost: \$330,050 StrTarget: 2 YEARS DistTarget: EA:	The strategy of encapsulating rust by multiple over coating of the paint system has reached the end of its useful life. Due to the thickness of the paint system, it is difficult to determine the extent of section loss in the steel members. The heavy build up of paint precludes early detection of potential fatigue cracking. Remove the existing paint system from the steel main span, to allow for fracture critical inspections, and then repaint. Estimated at 9,500 square feet x \$35 per sq. ft. = \$332,500 (NOT including traffic handling costs).
RecDate: 04/05/1999 Action : Bridge-Replace Work By: STRAIN Status : LONG LEAD	EstCost: \$13,200,000 StrTarget: 2 YEARS DistTarget: EA: 40110K	Replace the steel main span. Estimated at \$2,000,000 (NOT including traffic handling costs). Or, replace the entire structure. Estimated at \$13,200,000.

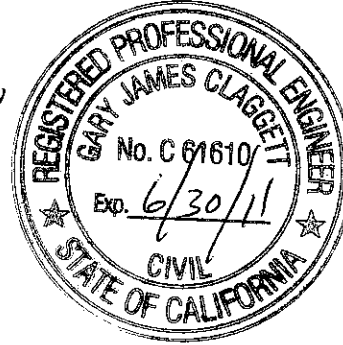
WORK RECOMMENDATIONS

RecDate: 07/01/1986	EstCost: \$1,500,000	Remove and replace the bolted connections
Action : Sub-Misc.	StrTarget: 2 YEARS	and hardware (threaded rods, malleys,
Work By: STRAIN	DistTarget:	nuts, plates, etc) throughout the entire
Status : LONG LEAD	EA: 40110K	timber sub-structure. Replace the top
		left horizontal timber element between
		Bent 15 and Bent 16.

RecDate: 02/10/1984	EstCost: \$1,008,600	F1-10 / F2-6 / F3-1 / Rail Type-WOOD.
Action : Railing-Upgrade	StrTarget: 2 YEARS	Replace the bridge rail.
Work By: STRAIN	DistTarget:	
Status : LONG LEAD	EA: 40110K	

Inspected By : T.Sandoval/G. Claggett

Gary Claggett
Registered Civil Engineer



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 10 0136
 (5) INVENTORY ROUTE(ON/UNDER)- ON 131000010
 (2) HIGHWAY AGENCY DISTRICT 01
 (3) COUNTY CODE 045 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- ALBION RIVER
 (7) FACILITY CARRIED- STATE ROUTE 1
 (9) LOCATION- 01-MEN-001-43.74
 (11) MILEPOINT/KILOMETERPOINT 43.74
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000101
 (16) LATITUDE 39 DEG 13 MIN 34 SEC
 (17) LONGITUDE 123 DEG 46 MIN 09 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

***** STRUCTURE TYPE AND MATERIAL *****

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL
 TYPE- TRUSS - DECK CODE 309
 (44) STRUCTURE TYPE APPR:MATERIAL- WOOD OR TIMBER
 TYPE- STRINGER/MULTI-BEAM OR GDR CODE 702
 (45) NUMBER OF SPANS IN MAIN UNIT 1
 (46) NUMBER OF APPROACH SPANS 33
 (107) DECK STRUCTURE TYPE- TIMBER CODE 8
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- BITUMINOUS CODE 6
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

***** AGE AND SERVICE *****

(27) YEAR BUILT 1944
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY 1
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 3300
 (30) YEAR OF ADT 2000 (109) TRUCK ADT 6 %
 (19) BYPASS, DETOUR LENGTH 51 KM

***** GEOMETRIC DATA *****

(48) LENGTH OF MAXIMUM SPAN 39.6 M
 (49) STRUCTURE LENGTH 295.4 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.9 M
 (52) DECK WIDTH OUT TO OUT 8.6 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 7.3 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 0 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 7.9 M
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 M
 (54) MIN VERT UNDERCLEAR REF- NOT H/RR 0.00 M
 (55) MIN LAT UNDERCLEAR RT REF- NOT H/RR 0.0 M
 (56) MIN LAT UNDERCLEAR LT 0.0 M

***** NAVIGATION DATA *****

(38) NAVIGATION CONTROL- BR PERMIT REQ CODE 1
 (111) PIER PROTECTION- NOT REQUIRED CODE 1
 (39) NAVIGATION VERTICAL CLEARANCE 50.0 M
 (116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR M
 (40) NAVIGATION HORIZONTAL CLEARANCE 35.7 M

***** SUFFICIENCY RATING *****

SUFFICIENCY RATING = 69.0
 STATUS FUNCTIONALLY OBSOLETE
 HEALTH INDEX 79.4
 PAINT CONDITION INDEX = 35.5

***** CLASSIFICATION ***** CODE

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL RURAL 06
 (100) DEFENSE HIGHWAY- NOT STRAHNET 0
 (101) PARALLEL STRUCTURE- NONE EXISTS N
 (102) DIRECTION OF TRAFFIC- 2 WAY 2
 (103) TEMPORARY STRUCTURE-
 (105) FED.LANDS HWY- NOT APPLICABLE 0
 (110) DESIGNATED NATIONAL NETWORK - NOT ON NET 0
 (20) TOLL- ON FREE ROAD 3
 (21) MAINTAIN- STATE HIGHWAY AGENCY 01
 (22) OWNER- STATE HIGHWAY AGENCY 01
 (37) HISTORICAL SIGNIFICANCE- ELIGIBLE 2

***** CONDITION ***** CODE

(58) DECK 6
 (59) SUPERSTRUCTURE 6
 (60) SUBSTRUCTURE 6
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- M-13.5 OR H-15 2
 (63) OPERATING RATING METHOD- ALLOWABLE STRESS 2
 (64) OPERATING RATING- 51.2
 (65) INVENTORY RATING METHOD- ALLOWABLE STRESS 2
 (66) INVENTORY RATING- 30.8
 (70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
 (41) STRUCTURE OPEN, POSTED OR CLOSED- A
 DESCRIPTION- OPEN, NO RESTRICTION

***** APPRAISAL ***** CODE

(67) STRUCTURAL EVALUATION 6
 (68) DECK GEOMETRY 3
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 0110
 (113) SCOUR CRITICAL BRIDGES 5

***** PROPOSED IMPROVEMENTS *****

(75) TYPE OF WORK- DECK REPLACEMENT CODE 37
 (76) LENGTH OF STRUCTURE IMPROVEMENT 295.4 M
 (94) BRIDGE IMPROVEMENT COST \$2,540,000
 (95) ROADWAY IMPROVEMENT COST \$508,000
 (96) TOTAL PROJECT COST \$4,267,200
 (97) YEAR OF IMPROVEMENT COST ESTIMATE 2010
 (114) FUTURE ADT 5080
 (115) YEAR OF FUTURE ADT 2031

***** INSPECTIONS *****

(90) INSPECTION DATE 10/09 (91) FREQUENCY 24 MO
 (92) CRITICAL FEATURE INSPECTION: (93) CFI DATE
 A) FRACTURE CRIT DETAIL- YES 24 MO A) 03/08
 B) UNDERWATER INSP- NO MO B)
 C) OTHER SPECIAL INSP- NO MO C)